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Memoirs of the Museum of Comparative Zoölogy
AT HARVARD COLLEGE.
Vol. XLVIII.

REPORTS ON AN EXPLORATION OFF THE WEST COASTS OF MEXICO, CENTRAL AND SOUTH AMERICA, AND OFF THE GALAPAGOS ISLANDS, IN CHARGE OF ALEXANDER AGASSIZ, BY THE U. S. FISH COMMISSION STEAMER "ALBATROSS," DURING 1891, LIEUT.-COMMANDER Z. L. TANNER, U. S. N., COMMANDING.

XXXVIII.

REPORTS ON THE SCIENTIFIC RESULTS OF THE EXPEDITION TO THE TROPICAL PACIFIC, IN CHARGE OF ALEXANDER AGASSIZ, BY THE U. S. FISH COMMISSION STEAMER "ALBATROSS," FROM AUGUST, 1899, TO MARCH, 1900, COMMANDER JEFFERSON F. MOSER, U. S. N., COMMANDING.

XX.

REPORTS ON THE SCIENTIFIC RESULTS OF THE EXPEDITION TO THE EASTERN TROPICAL PACIFIC, IN CHARGE OF ALEXANDER AGASSIZ, BY THE U. S. FISH COMMISSION STEAMER "ALBATROSS," FROM OCTOBER, 1904, TO MARCH, 1905, LIEUT.-COMMANDER L. M. GARRETT, U. S. N., COMMANDING.

XXXI.

THE ANNELIDA POLYCHAETA.

By RALPH V. CHAMBERLIN.

WITH EIGHTY PLATES.

TEXT.

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CONTENTS.

REPORTS on an Exploration off the West Coasts of Mexico, Central and South America, and off the Galapagos Islands, in charge of ALEXANDER AGASSIZ, by the U. S. Fish Commission Steamer "Albatross," during 1891, Lieut. Commander Z. L. TANNER, U. S. N., Commanding. XXXVIII. Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of ALEXANDER AGASSIZ, by the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander JEFFERSON F. MOSER, U. S. N., Commanding. XX. Reports on the Scientific Results of the Expedition to the Eastern Tropical Pacific, in charge of ALEXANDER AGASSIZ, by the U. S. Fish Commission Steamer "Albatross," from October, 1904, to March, 1905, Lieut.-Commander L. M. GARRETT, U. S. N., Commanding. XXXI. THE ANNELIDA POLYCHAETA. By RALPH V. CHAMBERLIN. 514 pp. 80 plates. July, 1919.

TABLE OF CONTENTS.

PAGE
- Introduction 13
- Lists of Species 14
    - Expedition of 1890–1891 . . . 14
    - Expedition of 1899–1900 . . . 14
    - Expedition of 1904–1905 . . . 15
    - Atlantic Expeditions, 1884–1887 . 16
- Bathymetrical Distribution 16
    - Littoral Zone, 0–50 fms. . . . 16
    - Continental Zone, 50–500 fms. . 16
    - Abyssal Zone, below 500 fms. . 16
    - Pelagic Zone 18
- Classification 18
- Key to the Families 19
- Amphinomidae 23
    - Key to Genera 25
    - Synonymy of Genera 25
    - Notopygos Grube 25
    - N. maculata (Kinberg) 26
    - Hermodice Kinberg 26
    - H. striata Kinberg 26
    - Amphinome Bruguière 26
    - A. vagans (Savigny) 27
    - Eurythoe Kinberg 27
    - E. complanata (Pallas) 28
    - Chloeia Savigny 30
    - C. entypa, sp. nov. 31
- Euphrosynidae 32
    - Key to Genera 32
    - Euphrosyne Savigny 32
    - E. panamica, sp. nov. 33
- Polynoidae 35
    - Key to Genera 37
    - Synonymy of Genera 40
    - Plotolepis, gen nov. 40
    - P. nans, sp. nov. 41
    - Podarmus, gen. nov. 45
    - P. ploa, sp. nov. 46
    - Harmopsides, gen. nov. 48
    - natans, sp. nov. 48
    - Harmothoe Kinberg 51

PAGE
    - H. hirsuta Johnson 51
    - H. mexicana, sp. nov. 54
    - Eunoe Malmgren 58
    - E. eura, sp. nov. 58
    - Lepidasthenia Malmgren 61
    - Key to Species 61
    - L. curta, sp. nov. 61
    - Iphione Kinberg 64
    - I. ovata Kinberg 64
    - Admetella McIntosh 64
    - A. hastigerens, sp. nov. 64
    - A. dolichopus, sp. nov. 67
    - Polynoe Savigny 70
    - P. innatans, sp. nov. 70
    - P. nesiotes, sp. nov. 72
    - Lepidonotus Leach 74
    - L. johnstoni Kinberg 74
    - L. nesophilus, sp. nov. 75
- Aphroditidae 78
    - Key to Genera 79
    - Aphrodita Linné 79
    - A. defendens, sp. nov. 80
    - Laetmonice Kinberg 81
    - L. wyvillei McIntosh 82
    - L. benthaliana McIntosh 82
    - L. sp. 83
    - Pontogenia Claparède 83
    - P. curva, sp. nov. 83
- Acoetidae 85
    - Key to Genera 85
    - Synonymy of Genera 86
    - Panthalis Kinberg 86
    - P. panamensis, sp. nov. 86
- Sigalionidae 89
    - Key to Genera 89
    - Synonymy of Genera 90
    - Sthenolepis Willey 90
    - S. areolata (McIntosh) 90
    - Sigalion Cuvier 91
    - S. pourtalesi Ehlers 91

PAGE
Polylepididae 91
Key to Genera 91
Synonymy of Genera 91
Palmyridae 92
Key to Genera 92
Chrysopetalidae 92
Key to Genera 92
Nepthydidae 92
Nepthys Cuvier 93
N. ectopa, sp. nov. 94
N. sp. 97
Phyllodocidae 97
Key to the Subfamilies and Genera . 99
Synonymy of Genera 101
Anaitides Czerniawsky 102
Key to Species 102
A. lamellifera (Pallas) 103
A. patagonica (Kinberg) 104
A. compsa, sp. nov. 105
Phyllodoce Savigny 108
P. fakaravana, sp. nov. 108
P. medipapillata Moore 111
P. sp. a. 111
P. sp. b. 112
P. sp. c. 113
Lopadorrhynchus Grube 113
Key to Species 114
L. parvum, sp. nov. 114
L. nans, sp. nov. 116
Mastigethus, gen. nov. 119
M. errans, sp. nov. 120
Pelagobia Greeff 122
Key to Species 122
P. viguieri Gravier 122
Nans, gen. nov. 125
N. simplex, sp. nov. 125
Pontodoridae 127
Iospilidae 127
Key to Genera 128
Lacydoniidae 128
Otopsidae 128
Pisionidae 128
Key to Genera 128
Alciopidae 129
Key to Genera 130
Alciopa Audouin & Milne Edwards . 130
A. cantrainii (Delle Chiaji) . . . 130
Torea Quatrefages 131
T. pelagica, sp. nov. 131

PAGE
Vanadis Claparède 133
Key to Species 133
V. formosa Claparède 134
Mauita, gen. nov. 135
M. nans, sp. nov. 136
Halodora Greeff 139
H. reynaudii (Audouin & Milne Edwards) 139
Corynocephalus Levinsen 141
Key to Species 141
C. paumotanus, sp. nov. 141
Plotohelmis, gen. nov. 143
P. alata, sp. nov. 144
Rhynchonerella A. Costa 146
Key to Species 146
R. cincinnata (Greeff) 146
R. pycnocera, sp. nov. 147
R. parva, sp. nov. 150
Typhloscolecidae 151
Key to Genera 152
Typhloscolex Busch 152
T. müllerii Busch 152
Sagitella N. Wagner 153
S. kowalewskii N. Wagner 153
S. sp. a. 153
Plotobia, gen. nov. 154
P. simplex, sp. nov. 155
P. coniceps, sp. nov. 156
Tomopteridae 158
Tomopteris Eschscholtz 159
T. innatans, sp. nov. 159
T. eura, sp. nov. 160
T. idiura, sp. nov. 161
T. sp. a. 162
T. sp. b. 162
Syllidae 163
Key to the Subfamilies and Genera . 164
Synonymy of Genera 166
Autolytus Grube 167
A. obliquatus, sp. nov. 168
A. planipalpus, sp. nov. 170
A. torquens, sp. nov. 172
Syllis Savigny 174
Key to Subgenera 174
S. remex, sp. nov. 175
Synelmis, gen. nov. 176
S. simplex, sp. nov. 177
Odontosyllis Claparède 180
O. atypica, sp. nov. 180

PAGE
Sphaerodoridae 182
  Key to Genera 182
  Synonymy of Genera 182
Hesionidae 183
  Key to Genera 185
  Synonymy of Genera 185
  Hesione Savigny 186
  H. pacifica McIntosh 186
  H. genetta Grube 186
  H. panamena, sp. nov. 188
  Leocrates Kinberg 190
  L. iris (Grube) 190
  L. anomalus, sp. nov. 190
Nereidae 191
  Key to Genera 194
  Synonymy of Genera 195
  Kainonereis, gen. nov. 196
  K. alata, sp. nov. 197
  Nereis Linné 202
  N. segrex, sp. nov. 202
  N. leuca, sp. nov. 205
  N. caenocirrus, sp. nov. 209
  N. pelagica Linné 213
  Ceratonereis Kinberg 213
  C. fakaravae, sp. nov. 213
  Uncinereis, gen. nov. 215
  U. subita, sp. nov. 216
  Platynereis Kinberg 219
  P. polyscalma, sp. nov. 219
  Perinereis Kinberg 227
  P. helleri Grube 227
  Pseudonereis Kinberg 227
  P. atopodon, sp. nov. 228
Leodicidae 229
  Key to Genera 231
  Synonymy of Genera 232
  Leodice Savigny 232
  Key 232
  L. makemoana, sp. nov. 233
  L. siciliensis (Grube) 236
  L. segregata, sp. nov. 237
  L. lita, sp. nov. 240
  L. oliga, sp. nov. 244
  L. oliga papeetensis, subsp. nov. . . 248
  L. pauroneurata, sp. nov. 249
  L. nesiotes, sp. nov. 253
  Key 256
  L. panamena, sp. nov. 256
  L. contingens, sp. nov. 260

PAGE
Onuphididae 263
  Key to Genera 264
  Onuphis Audouin & Milne Edwards . 265
  Key 265
  O. proalopus, sp. nov. 265
  O. nannognathus, sp. nov. . . . 270
  O. litabranchia, sp. nov. 274
  O. pachytmema, sp. nov. 279
  O. socia, sp. nov. 284
  O. lepta, sp. nov. 290
  Key 295
  O. crassisetosa, sp. nov. 295
  O. cobra, sp. nov. 300
  Paronuphis Ehlers 306
  P. solenotecton, sp. nov. 306
  Hyalinoecia Malmgren 310
  H. tecton, sp. nov. 310
  H. tubicola (O. F. Müller) . . . 315
  H. leucacra, sp. nov. 317
  Leptoecia, gen. nov. 319
  L. abyssorum, sp. nov. 320
Lumbrinereidae 324
  Key to Genera 325
  Synonymy of Genera 326
  Lumbrinereis Blainville 327
  L. bifilaris Ehlers 327
  Cenothrix, gen. nov. 329
  C. mutans, sp. nov. 330
  Cenogenus, gen. nov. 333
  C. descendens, sp. nov. 333
  Oenone Savigny 334
  O. telura, sp. nov. 334
Dorvilleidae 338
  Key to Genera 339
  Synonymy of Genera 339
  Dorvillea, Parfitt 339
  D. crassa, sp. nov. 339
Glyceridae 343
  Key to Genera 344
  Synonymy of Genera 344
  Telake, gen. nov. 345
  T. epipolasis, sp. nov. 346
  Hemipodus Quatrefages 348
  H. mexicanus, sp. nov. 349
  Glycera Savigny 350
  G. dibranchiata Ehlers 350
  G. profundi, sp. nov. 350
  G. fundicola, sp. nov. 352

Page

- Ariciidae 353
  - Key to Genera 354
  - Nainereis Blainville 354
  - N. retusiceps, sp. nov. 355
  - Branchethus, gen. nov. 357
  - B. latum, sp. nov. 358
- Paraonidae 361
  - Key to Genera 362
- Goniadidae 362
  - Key to Genera 363
  - Synonymy of Genera 363
  - Goniada Audouin & Milne Edwards 363
  - G. eremita Audouin & Milne Edwards 363
- Chaetopteridae 363
  - Key to Genera 365
  - Synonymy of Genera 365
  - Chaetopterus Cuvier 366
  - C. pergamentaceus Cuvier 366
- Spionidae 367
  - Key to Genera 368
  - Synonymy of Genera 369
  - Boccardia Haswell 369
  - B. polybranchia (Haswell) 369
- Disomididae 369
  - Key to Genera 369
  - Synonymy of Genera 370
- Cirratulidae 370
  - Key to Genera 372
  - Cirrineris Blainville 372
  - C. nesiotes, sp. nov. 373
  - Cirratulus Lamarck 374
  - C. megalus, sp. nov. 375
  - C. sinincolens, sp. nov. 377
  - C. danielseni Hensen 379
  - Audouinia Quatrefages 380
  - A. filigera nesophila, subsp. nov. 380
  - Dodecaceria Oersted 381
  - D. concharum Oersted 381
- Opheliidae 382
  - Key to Genera 384
  - Synonymy of Genera 385
  - Kesun, gen. nov. 385
  - K. fusus, sp. nov. 386
  - Travisia Johnston 387
  - T. profundi, sp. nov. 387
- Scalibregmidae 389
  - Key to Genera 390
  - Synonymy of Genera 390

Page

  - Scalibregma H. Rathke 391
  - S. inflatum H. Rathke 392
- Arenicolidae 392
  - Key to Genera 394
  - Arenicola Lamarck 394
  - A. cristata Stimpson 394
- Flabelligeridae 394
  - Key to Genera 396
  - Synonymy of Genera 397
  - Flabelligera M. Sars 397
  - F. infundibularis Johnson 397
  - F. affinis M. Sars 397
  - Brada Stimpson 399
  - B. verrucosa, sp. nov. 399
  - B. irenaia, sp. nov. 400
  - Ilyphagus, gen. nov. 402
  - I. bythincola, sp. nov. 402
  - I. pluto, sp. nov. 403
  - I. ascendens, sp. nov. 403
- Sternaspidae 404
  - Sternaspis Otto 405
  - S. fossor Stimpson 405
  - S. maior, sp. nov. 406
- Maldanidae 407
  - Key to the Subfamilies and Genera 409
  - Synonymy of Genera 410
  - Petaloproctus Quatrefages 410
  - P. crenatus, sp. nov. 410
  - Maldanella McIntosh 412
  - M. fibrillata, sp. nov. 413
  - Sonatsa, gen. nov. 415
  - S. meridionalis, sp. nov. 416
  - Gen. et sp. ? 418
- Ammocharidae 418
- Terebellidae 418
  - Key to the Subfamilies and Genera 420
  - Synonymy of Genera 423
  - Terebella Linné 424
  - T. panamena, sp. nov. 424
  - Nicolea Malmgren 425
  - N. taboguillae, sp. nov. 425
  - N. galapagensis, sp. nov. 427
  - N. profundi, sp. nov. 429
  - N. latens, sp. nov. 430
  - Eupolymnia Verrill 432
  - E. regnans, sp. nov. 433
  - E. insulana, sp. nov. 434
  - Thelepus Leuckart 437
  - T. pericensis, sp. nov. 437

PAGE
Terebellides M. Sars 438
T. eurystethus, sp. nov. 438
Ampharetidae 440
Key to the Subfamilies and Genera . 442
Synonymy of Genera 444
Ampharete Malmgren 444
A. homa, sp. nov. 444
Amphicteis Grube 447
A. obscurior, sp. nov. 447
A. uncopalea, sp. nov. 448
A. orphnius, sp. nov. 450
Moyanus, gen. nov. 451
M. explorans, sp. nov. 452
Sabellides Milne Edwards 455
S. delus, sp. nov. 455
Pabits, gen. nov. 456
P. deroderus, sp. nov. 457
Paiwa, gen. nov. 459
P. abyssi, sp. nov. 459
Gen. et sp. 461
Amphictenidae 461
Key to Genera 463
Cistenides Malmgren 463
C. granulata (Linné) 463
Capitellidae 463
Key to Genera 465

PAGE
Synonymy of Genera 466
Notomastus Sars 466
N. latericeus Sars 466
Sabellidae 466
Key to Genera 468
Synonymy of Genera 470
Dasychonopsis Bush 472
D. nigromaculata (Baird) 472
Serpulidae 472
Key to Genera 473
Synonymy of Genera 477
Pomatoceros Philippi 479
P. paumotanus, sp. nov. 479
Spirobranchus Blainville 481
S. tricornis (Mörch) 481
Paumotella, gen. nov. 481
P. takemoana, sp. nov. 482
Sabellariidae 483
Key to Genera 484
Synonymy of Genera 484
Idanthyrsus Kinberg 485
I. cretus, sp. nov. 485
I. regalis, sp. nov. 487
Tetreres Caullery 490
T. nesiotes, sp. nov. 490
Index 495

ALBATROSS POLYCHAETA.

INTRODUCTION.

THE annelids with which the present memoir is concerned are embraced in collections made by the ALBATROSS during three distinct expeditions in charge of Mr. Alexander Agassiz to contiguous, and in some degree overlapping, areas of the Tropical Pacific Ocean. In the first of these, explorations were made off the west coasts of Mexico, Central, and northern South America, and off the Galapagos Islands from February to May, 1891. So far as concerns the polychaetes collected, the second expedition covered the region from the Marquesas and Paumotus westward to the Ellice, Gilbert, and Marshall Islands and was carried on from September, 1899, to March, 1900. The third expedition, continued from October, 1904, to March, 1905, covered an extensive area principally off the South American coast from Panama southward to Peru and eastward to the Galapagos, Easter Island, and the Paumotus. In addition, thirteen species from earlier expeditions of the ALBATROSS in the Atlantic are listed in this Memoir.

These three expeditions, with the exception in some degree of the second, covered areas essentially untouched by other expeditions, and the annelid forms have proved in large measure new. No fewer than one hundred and eighteen out of a total of one hundred and seventy-five species seem not to have been previously described, these including twenty-three new generic types of which several are of high interest. While the littoral forms are well represented, these coming chiefly from Panama and the Polynesian Islands, chief interest attaches to the abyssal and pelagic species. The collection of pelagic species is exceptionally rich and important. Aside from relatively numerous representatives of strictly pelagic families, such as the Alciopidae, Typhloscolecidae, and Tomopteridae, many forms from other families were secured which are either in the epitokous pelagic phase or are completely pelagic. Mention may be made of the epitokes of the Nereidae, including the peculiar new genus Kainonereis taken by night light off the Gilbert Islands, and those of the Syllidae, including the new generic type Synelmis. Considerable additions are made to the pelagic species of the Phyllodocidae, two representing new genera, Mastigethus and Nans. To the six previously known pelagic Polynoidae, four are added, three being types of genera of which attention may be called to Plotolepis, a form showing peculiar adaptations to life at the surface in its greatly elongate and inflated notocirri and in its vesicular though reduced elytra. Complete lists of the forms taken in the different bathymetrical zones are given (p. 16–18).

Separate lists of the forms secured by the different expeditions are here given. It may be noted that duplication of species is negligible.

LISTS OF SPECIES.

Expedition of **1891.**

Chloeia entypa, sp. nov.
Harmothoe mexicana, sp. nov.
Lepidasthenia curta, sp. nov.
Admetella dolichopus, sp. nov.
Polynoe nesiotes, sp. nov.
Laetmonice benthaliana McIntosh
                sp.
Nepthys sp.
Anaitides compsa, sp. nov.
Phyllodoce medipapillata Moore
Hesione panamena, sp. nov.
Leodice segregata, sp. nov.
            pauroneurata, sp. nov.
            panamena, sp. nov.
Onuphis nannognathus, sp. nov.
            litabranchia, sp. nov.
            lepta, sp. nov.
            crassisetosa, sp. nov.
            cobra, sp. nov.
Paronuphis solenotecton, sp. nov.
Hyalinoecia tecton, sp. nov.
                tubicola (O. F. Müller)
                leucacra, sp. nov.

Lumbrinereis bifilaris Ehlers
Hemipodus mexicanus, sp. nov.
Glycera profundi, sp. nov.
Branchethus latum, gen. et sp. nov.
Chaetopterus pergamentaceus Cuvier
Cirratulus sinincolens, sp. nov.
Brada verrucosa, sp. nov.
          irenaia, sp. nov.
Ilyphagus bythincola, sp. nov.
Sternaspis fossor Stimpson
                maior, sp. nov.
Maldanella fibrillata, sp. nov.
Maldanidarum, gen. et sp.?
Nicolea latens, sp. nov.
Eupolymnia regnans, sp. nov.
Thelepus pericensis, sp. nov.
Ampharete homa, sp. nov.
Ampharetidarum, gen. et sp.?
Amphicteis obscurior, sp. nov.
                uncopalea, sp. nov.
                orphnius, sp. nov.
Sabellides delus, sp nov.
Spirobranchus tricornis (Mörch)

Expedition of **1899–1900.**

Hermodice striata Kinberg
Amphinome vagans (Savigny)
Eurythoe complanata (Pallas)
Iphione ovata Kinberg
Panthalis panamensis, sp. nov.

Phyllodoce fakaravana, sp. nov.
                sp.
Nans simplex, gen. et sp. nov.
Halodora reynaudii (Audouin and Milne Edwards)

Corynocephalus paumotanus, sp. nov.
Plotohelmis alata, sp. nov.
Rhynchonerella parva, sp nov.
Typhloscolex mülleri Busch
Tomopteris innatans, sp. nov.
Autolytus obliquatus, sp. nov.
  planipalpus, sp. nov.
  torquens, sp. nov.
Syllis remex, sp. nov.
Synelmis simplex, gen. et sp. nov.
Odontosyllis atypica, sp. nov.
Hesione pacifica McIntosh
  genetta Grube
Leocrates iris (Grube)
  anomalus, sp. nov.
Kainonereis alata, gen. et sp. nov.
Nereis leuca, sp. nov.
  caenocirrus, sp. nov.
Ceratonereis fakaravae, sp. nov.
Platynereis polyscalma, sp. nov.
Perinereis helleri Grube
Pseudonereis atopodon, sp. nov.
Leodice makemoana, sp. nov.
  lita, sp. nov.
  oliga, sp. nov.
  oliga papeetensis, subsp. nov.
  nesiotes, sp. nov.
Oenone telura, sp. nov.
Dorvillea crassa, sp. nov.
Telake epipolasis, gen. et sp. nov.
Nainereis retusiceps, sp. nov.
Kesun fusus, gen. et sp. nov.
Pabits deroderus, gen. et sp. nov.
Pomatoceros paumotanus, sp. nov.
Paumotella takemoana, gen. et sp. nov.
Tetreres nesiotes, sp. nov.

Expedition of 1904–1905.

Notopygos maculata (Kinberg)
Amphinome vagans (Savigny)
Eurythoe complanata (Pallas)
Euphrosyne panamica, sp. nov.
Plotolepis nans, gen. et sp. nov.
Podarmus ploa, gen. et sp. nov.
Harmopsides natans, gen. et sp. nov.
Harmothoe hirsuta Johnson
Eunoe eura, sp. nov.
Admetella hastigerens, sp. nov.
Polynoe innatans, sp. nov.
Lepidonotus johnstoni Kinberg
  nesophilus, sp. nov.
Aphrodita defendens, sp. nov.
Laetmonice wyvillei McIntosh
  benthaliana McIntosh
Sthenolepis areolata (McIntosh)
Nephtys ectopa, sp. nov.
Anaitides lamellifera (Pallas)
  patagonica (Kinberg)
Phyllodoce sp. b.
  sp. c.
Lopadorrhynchus parvum, sp. nov.
  nans, sp. nov.
Mastigethus errans, gen. et sp. nov.
Pelagobia viguieri Gravier
Alciopa cantrainii (Delle Chiaji)
Torea pelagica, sp. nov.
Vanadis formosa Claparède
Mauita nans, gen. et sp. nov.
Halodora reynaudii (Audouin and Milne Edwards)
Corynocephalus paumotanus, sp. nov.
Rhynchonerella cincinnata (Greeff)
  pycnocera, sp. nov.
Sagitella kowalewskii N. Wagner
  sp. a.
Plotobia simplex, gen. et sp. nov.
  coniceps, sp. nov.
Tomopteris innatans, sp. nov.
  eura, sp. nov.
  idiura, sp. nov.
  sp. a.
  sp. b.
Nereis segrex, sp. nov.
Uncinereis subita, gen. et sp. nov.
Perinereis helleri Grube.
Leodice siciliensis (Grube)
  contingens, sp. nov.
Onuphis proalopus, sp. nov.
  pachytmema, sp. nov.
  socia, sp. nov.
  crassisetosa, sp. nov.
Hyalinoecia tubicola (O. F. Müller)
Leptoecia abyssorum, gen. et sp. nov.
Lumbrinereis bifilaris Ehlers.

- Cenothrix mutans, gen. et sp. nov.
- Cenogenus descendens, gen. et sp. nov.
- Glycera fundicola, sp. nov.
- Cirrineris nesiotes, sp. nov.
- Cirratulus megalus, sp. nov.
- Audouinia filigera nesophilus, subsp. nov.
- Travisia profundi, sp. nov.
- Ilyphagus pluto, gen. et sp. nov.
  - ascendens, gen. et sp. nov.
- Petaloproctus crenatus, sp. nov.
- Sonatsa meridionalis, gen. et sp. nov.
- Terebella panamena, sp. nov.
- Nicolea taboguillae, sp. nov.
  - galapagensis, sp. nov.
  - profundi, sp. nov.
  - latens, sp. nov.
- Eupolymnia insulana, sp. nov.
- Terebellides eurystethus, sp. nov.
- Moyanus explorans, gen. et sp. nov.
- Paiwa abyssi, gen. et sp. nov.
- Idanthyrsus cretus, sp. nov.
  - regalis, sp. nov.

Atlantic Expeditions 1884–1890.

- Pontogenia curva, sp. nov.
- Sigalion pourtalesi Ehlers
- Nereis pelagica Linné
- Glycera dibranchiata Ehlers
- Goniada eremita Audouin & Milne Edwards
- Cirratulus danielseni Hansen
- Dodecaceria concharum Oersted
- Scalibregma inflatum H. Rathke
- Arenicola cristata Stimpson
- Flabelligera affinis M. Sars
- Cistenides granulata (Linné)
- Notomastus latericeus Sars
- Dasychonopsis nigromaculata (Baird)

BATHYMETRICAL DISTRIBUTION.

The bathymetrical distribution of the species may be indicated sufficiently by means of the following lists.

Littoral Zone (0 *to* 50 *fms.*).

- Notopygos maculata (Kinberg)
- Hermodice striata Kinberg
- Eurythoe complanata (Pallas)
- Euphrosyne panamica, sp. nov.
- Harmothoe hirsuta Johnson
- Iphione ovata Kinberg
- Polynoe nesiotes, sp. nov.
- Lepidonotus johnstoni Kinberg
  - nesophilus, sp. nov.
- Pontogenia curva, sp. nov.
- Panthalis panamensis, sp. nov.
- Sigalion pourtalesi Ehlers
- Nepthys sp.
- Anaitides lamellifera (Pallas)
  - compsa, sp. nov.
- Phyllodoce fakaravana, sp. nov.
  - medipapillata Moore
  - sp. a.
- Synelmis simplex, gen. et. sp. nov.
- Hesione pacifica McIntosh
  - genetta Grube
  - panamena, sp. nov.
- Leocrates iris (Grube)
  - anomalus, sp. nov.
- Ceratonereis fakaravae, sp. nov.
- Perinereis helleri Grube
- Pseudonereis atopodon, sp. nov.
- Leodice makemoana, sp. nov.
  - siciliensis, (Grube)
  - lita, sp. nov.
  - oliga, sp. nov.
  - oliga papeetensis, subsp. nov.
  - nesiotes, sp. nov.
  - panamena, sp. nov.
- Cenothrix mutans, gen. et sp. nov.
- Oenone telura, sp. nov.

Dorvillea crassa, sp. nov.
Nainereis retusiceps, sp. nov.
Chaetopterus pergamentaceus Cuvier
Cirrineris nesiotes, sp. nov.
Audouinia filigera nesophilus, subsp. nov.
Dodecaceria concharum Oersted
Flabelligera affinis M. Sars
Terebella panamena, sp. nov.
Nicolea taboguillae, sp. nov.
galapagensis, sp. nov.
Eupolymnia regnans, sp. nov.
Thelepus pericensis, sp. nov.
Dasychonopsis nigromaculata (Baird)
Pomatoceros paumotanus, sp. nov.
Spirobranchus tricornis (Mörch)
Paumotella takemoana, gen. et sp. nov.
Idanthyrsus cretus, sp. nov.
regalis, sp. nov.
Tetreres nesiotes, sp. nov.

Continental Zone (50 *to* 500 *fms.*).

Chloeia entypa, sp. nov.
Laetmonice benthaliana McIntosh
Sthenolepis areolata (McIntosh)
Leodice segregata, sp. nov.
pauroneurata, sp. nov.
contingens, sp. nov.
Onuphis crassisetosa, sp. nov.
Glycera dibranchiata Ehlers
Branchethus latum, gen. et sp. nov.
Goniada eremita Audouin and Milne Edwards
Scalibregma inflatum H. Rathke
Flabelligera infundibularis Johnson
Brada verrucosa, sp. nov.
Sternaspis fossor Stimpson
Eupolymnia insulana, sp. nov.
Amphicteis obscurior, sp. nov.
orphnius, sp. nov.
Cistenides granulata (Linné)
Notomastus latericeus Sars

Abyssal Zone (*below* 500 *fms.*).

a. 500 *to* 1,000 *fms.*

Harmothoe mexicana, sp. nov.
Lepidasthenia curta, sp. nov.
Admetella hastigerens, sp. nov.
dolichopus, sp. nov.
Laetmonice benthaliana McIntosh
Anaitides patagonica (Kinberg)
Nereis segrex, sp. nov.
Uncinereis subitus, gen. et sp. nov.
Leodice segregata, sp. nov.
Onuphis proalopus, sp. nov.
nannognathus, sp. nov.
crassisetosa, sp. nov.
Hyalinoecia tecton, sp. nov.
tubicola (O. F. Müller)
leucacra, sp. nov.
Lumbrinereis bifilaris Ehlers
Hemipodus mexicanus, sp. nov.
Glycera profundi, sp. nov.
Cirratulus megalus, sp. nov.
sinincolens, sp. nov.
Ilyphagus ascendens, gen. et sp. nov.
Sternaspis maior, sp. nov.
Petaloproctus crenatus, sp. nov.
Nicolea latens, sp. nov.
Terebellides eurystethus, sp. nov.
Ampharete homa, sp. nov.
Ampharetidarum, gen. et sp.?
Amphicteis uncopalea, sp. nov.
Sabellides delus, sp. nov.

b. 1000 *to* 2000 *fms.*

Aphrodita defendens, sp. nov.
Laetmonice sp.
Nepthys ectopa, sp. nov.
Onuphis litabranchia, sp. nov.
Onuphis lepta, sp. nov.
cobra, sp. nov.
Paronuphis solenotecton, sp. nov.
Hyalinoecia tubicola (O. F. Müller)

Brada irenaia, sp. nov.
Ilyphagus bythincola, gen. et sp. nov.
Maldanella fibrillata, sp. nov.
Maldanidarum, gen. et sp.?
Nicolea profundi, sp. nov.

c. 2000 *fms. and below.*

Eunoe eura, sp. nov.
Laetmonice wyvillei McIntosh
Onuphis pachytmema, sp. nov.
  socia, sp. nov.
Leptoecia abyssorum, gen. et sp. nov.
Cenogenus descendens, gen. et sp. nov.
Kesun fusus, gen. et sp. nov.
Travisia profundi, sp. nov.
Ilyphagus pluto, gen. et sp. nov.
Sonatsa meridionalis, gen. et sp. nov.
Terebellides eurystethus, sp. nov.
Moyanus explorans, gen. et sp. nov.
Pabits deroderus, gen. et sp. nov.
Paiwa abyssi, gen. et sp. nov.

Pelagic Zone.

Amphinome vagans (Savigny) (on drift)
Plotolepis nans, gen. et sp. nov.
Podarmus ploa, gen. et sp. nov.
Harmopsides natans, gen. et sp. nov.
Polynoe innatans, sp. nov.
Phyllodoce sp. c.
Lopadorrhynchus parvum, sp. nov.
  nans, sp. nov.
Mastigethus errans, gen. et sp. nov.
Pelagobia viguieri Gravier
Nans simplex, gen. et sp. nov.
Alciopa cantrainii (Delle Chiaji)
Torea pelagica, sp. nov.
Vanadis formosa Claparède.
Mauita nans, gen. et sp. nov.
Halodora reynaudii (Audouin and Milne Edwards)
Corynocephalus paumotanus, sp. nov.
Plotohelmis alata, gen. et sp. nov.
Rhynchonerella cincinnata (Greeff)
  pycnocera, sp. nov.
  parva, sp. nov.
Typhloscolex mülleri Busch
Sagitella kowalewskii N. Wagner
  sp. a.
Plotobia simplex, gen. et sp. nov.
  coniceps, gen. et sp. nov.
Tomopteris innatans, sp. nov.
  eura, sp. nov.
  idiura, sp. nov.
  sp. a.
  sp. b.
Autolytus obliquatus, sp. nov.
  planipalpus, sp. nov.
  torquens, sp. nov.
Syllis remex, sp. nov.
Odontosyllis atypica, sp. nov.
Kainonereis alata, gen. et sp. nov.
Nereis leucua, sp. nov.
  caenocirrus, sp. nov.
Platynereis polyscalma, sp. nov.
Telake epipolasis, gen. et sp. nov.
Glycera fundicola, sp. nov.

CLASSIFICATION.

The various efforts to divide the Polychaeta as a whole into major groups have not proved satisfactory and many difficulties remain to be surmounted before the broader affinities of the families can be elucidated. It seems best at present to follow the method used by Malmgren and various recent writers in considering the families separately and arranging them in an order bringing the more obviously related groups into general proximity. While the families in the main are compact and unquestionably natural assemblages, in certain cases families as received by some are by others divided into two or more less comprehensive ones. I have here, in general, favored the narrower limitation of the families; but it seems very convenient and desirable to have names for designating a number of the obviously natural assemblages of such families even though the majority of the families are left outside any such grouping. I have accordingly introduced a number of superfamily names. Thus, the elytra-bearing families Polylepididae, Sigalionidae, Acoetidae, Polynoidae, and Aphroditidae (*i.e.*, the Aphroditidae *sens. lat.* of some authors) are placed in a superfamily Aphroditoidea; the Leodicidae, Onuphididae, Lumbrinereidae, and Dorvilleidae (*nom. nov. pro* Staurocephalidae or Stauronereidae) in the Leodicoidea; the Glyceridae and Goniadidae in the Glyceroidea; the Disomididae (*nom. nov. pro* Disomidae), Spionidae and Apisthobranchidae in the Spionoidea; the Spintheridae, Euphrosynidae, and Amphinomidae in the Amphinomoidea; the Alciopidae, Lacydoniidae, Iospilidae, Pontodoridae, and Phyllodocidae in the Phyllodocoidea; the Syllidae and Hesionidae in the Sylloidea; the Serpulidae and Sabellidae in the Serpuloidae; and the Terebellidae, Ampharetidae, and Amphictenidae in the Terebelloidea.

Key to the Families.

a. Prostomium freely exposed.

b. Body bearing true elytra.. *Aphroditoidea.*

c. Elytra borne on all somites; neurocirri and dorsal branchiae rudimentary.... *Polylepididae.*

cc. Elytra not on all somites.

d. Elytra alternating with cirri in the anterior region but in the posterior region occurring on all somites, these at the same time bearing cirri or cirriform branchiae...... *Sigalionidae.*

dd. Elytra not thus arranged.

e. Elytra and cirri alternating almost regularly somite by somite. Two pedunculate eyes accompanied or not by sessile eyes; no facial tubercle; tentacles two or three; body elongate.. *Acoetidae.*

ee. Elytra not thus regularly alternating with cirri, but occurring on somites II, IV, and V,— or rarely on II, III, IV, and VI,— and on alternate succeeding somites to posterior region and then on alternate groups of two or most posteriorly of three somites.

f. Pharynx armed with four horny jaws; two or three tentacles; no facial tubercle, or this but weakly indicated.. *Polynoidae.*

ff. Jaws none or rudimentary; a median tentacle alone present; facial tubercle well developed.. *Aphroditidae.*

bb. Body not bearing true elytra.

c. Prostomium fused with the two succeeding somites and forming a head bifurcate in front and bearing four tentacular cirri of which the posterior pair are much the longer; other somites laterally prolonged and bearing biramous parapodia which are achaetous.... *Tomopteridae.*

cc. Not so.

d. Anterior somites (excepting rarely the first one to four) with neuropodial processes or tori nearly always more or less elongate at right angles to the axis of the body and linear, oval or lamellar in form, which bear numerous crochets or uncini in unmixed groups or series, or rarely the crochets few in number.

e. Body anteriorly either wholly without a group of filiform or branched branchial appendages, or these if present arising from the frayed margin of a campanuliform membrane surrounding the mouth except ventrally.

f. With branched or arborescent branchiae on middle region of the body.... *Arenicolidae.*

ff. With no branchiae on middle region of body.

g. No capillary setae, both notopodia and neuropodia bearing exclusively crochets, crochets few, with tori not elongate; body long, somites numerous; prostomium without appendages.......... *Uncinasetidae.*

gg. Capillary setae present. Tori much elongated with crochets numerous.

h. The first three fascicles of notopodial setae without corresponding ventral setae; uncinigerous tori elongate and very narrow, almost line-like; branchiae often present as the frayed margin of a circumoral membrane........ *Ammocharidae.*

hh. Either some other number than first three pairs of fascicles of notopodial setae or none at all without corresponding ventral setae; uncinigerous tori not line-like, usually elliptic or oblong; never with a group of branchiae about the mouth. *Maldanidae.*

ee. Body anteriorly with a group of filiform, dendritic or plumose branchiae.... *Terebelloidea.*

f. With two pairs of tentacular cirri; the most posterior division of the body consisting of five or six somites abruptly offset from the rest of the body, this caudal region short, flat and commonly ending in a short, thread-like process or cirrus...... *Amphictenidae.*

ff. With no tentacular cirri; most posterior division of body not of this form, consisting of more than ten somites.

g. Prostomium more or less fused with the peristomium and forming a supraoral lobe which bears numerous filiform tentacles, often in two groups, which are not at all retractile within the oesophagus; branchiae never more than three pairs, these commonly branched, or if simple nearly always of uniform thickness, filiform, only rarely subulate; anterior region never bearing series of stout paleae.. *Terebellidae.*

gg. Prostomium distinct; tentacles retractile within the oesophagus; branchiae most commonly four pairs, rarely only three or two pairs, always simple and strongly pointed or subulate; third somite often bearing two rows of conspicuous paleae. *Ampharetidae.*

dd. Crochets either lacking entirely on the first nine or more somites or, if present, never in unmixed groups or series but mingled with capillary setae.

e. Buccal armature complex, including several to many pairs of maxillae........ *Leodicoidea.*

f. No ventral cirri present; dorsal cirri rudimentary or foliaceous...... *Lumbrinereidae.*

ff. Dorsal and ventral cirri present.

g. Maxillae consisting of a few pieces only, these forming short series.

h. A pair of frontal tentacles, and a total of seven; peristomium entire.. *Onuphididae.*

hh. No frontal tentacles, the total from one to five; peristomium biannulate. *Leodicidae.*

gg. Maxillae numerous, small, forming two long series.................. *Dorvilleidae.*

ee. Buccal armature simple or none.

f. Capillary setae present only on the first nine to fourteen somites; elsewhere only crochets in series at the ends of which are the branchiae when present; tentacles two, small and retractile; parapodia in anterior region rudimentary, in the posterior none. *Capitellidae.*

ff. Setae not thus arranged.

g. Body on each side above the parapodia with a series of nearly globular capsules (cirri) each of which contains a tube wound in a ball; parapodia uniramous and without acicula.......... *Sphaerodoridae.*

gg. Without such capsular cirri and non-aciculiferous parapodia.

h. Prostomium long, conical and strongly annulated; bearing four short tentacles at its tip.......... *Glyceroidea.*

i. Parapodia of one form throughout the length of the body; proboscis with four similar jaws.......... *Glyceridae.*

ii. Anterior parapodia uniramous, the others biramous; proboscis with numerous pieces in its armature.......... *Goniadidae.*

hh. Prostomium not thus annulated and with four tentacles at its tip.

i. Prostomium without true tentacles; palpi absent or else present in the form of two greatly elongated tentaculiform bodies.

j. Body posteriorly with a conspicuous paired sternal plate, from the edges of which radiate numerous fascicles of long slender setae........*Sternaspidae.*
jj. Body without this structure.
k. Palpi present, greatly elongate and tentaculiform.............*Spionoidea.*
l. First parapodia greatly developed, directed forwards and bearing long setae which meet in the middle in front of the head; short spines or crochets present on somites II and III and sometimes IV..*Disomididae.*
ll. First parapodia not thus directed forward and bearing setae that cross in front; no stout spines on somites II, III, or IV.
m. Parapodia distinctly biramous, with notopodial setae freely protruding; a lamina caudad of each setigerous ramus; no ligula or intermediate branchia above neuropodium................*Spionidae.*
mm. Notopodia represented by dorsal branchiae in the bases of which the setae are concealed; no laminae caudad of setigerous rami; a ligula or branchia just above each neuropodium of the first seven pairs. *Apisthobranchidae.*
kk. No such palpi present on the prostomium.
l. Body with a distinct thorax of nine to fourteen somites in which the parapodia are uniramous and bear only simple hastate or lanceolate setae or paleae; the remaining part of body having parapodia biramous with neuropodia in the form of uncinigerous tori, this region in most with its anterior five, or less commonly but two, somites differentiated into a median region...............................*Chaetopteridae.*
ll. Not so.
m. Integument in considerable part strongly roughened or tesselated. Body short; somites annulated; branchiae when present few and anterior in position.............................*Scalibregmidae.*
mm. Integument not thus roughened; branchiae when present more numerous.
n. Branchiae none; cirri, excepting certain special anterior ones, very short and stumpy, two-jointed......................*Pisionidae.*
nn. Branchiae present; cirri when present not of this form.
o. Setae and branchiae throughout strictly lateral in position; body short, of few somites, these commonly annulated....*Opheliidae.*
oo. Branchiae dorsal or subdorsal in position; body elongate, consisting of numerous, short, simple somites.
p. Parapodia present as distinct setigerous prominences; cirri present. Body flattened dorsally, rounded ventrally; branchiae usually ligulate.
q. Setae strongly cross-striate or annulated; no crochets in posterior region; anal cirri two or four..........*Ariciidae.*
qq. Setae not annulated; crochets in posterior region; cirri three. *Paraonidae.*
pp. No distinct setigerous or parapodial prominences and no cirri; body convex dorsally; branchiae long and filiform and present on many or a considerable number of somites..*Cirratulidae.*
ii. Prostomium bearing true tentacles or palpi of ordinary form, or both tentacles and palpi.
j. Notopodial setae blade-like, strongly cross-striate, and arranged in radiate or palmate groups along each side of the dorsum which they cover wholly or in part.
k. Notopodia, at least in part, with capillary setae as well as paleae; notocirri on somites separated by one or more not bearing them..*Palmyridae.*
kk. Notopodia with paleae exclusively; notocirri on all parapodia. *Chrysopetalidae.*
jj. Parapodia not thus differing in character on alternate somites; notopodial setae not of this structure and arrangement.
k. Both notopodium and neuropodium bearing a conspicuous lamella on its edge in addition to the cirrus; notopodium also bearing a branchia which is cirriform.

Prostomium reduced, mostly quadrangular or rhomboidal with one or two pairs of small tentacles on its anterior margin........*Nepthydidae.*

kk. Parapodia without such lamella on its rami; branchiae never cirriform, but arborescent, pennatifid or none.

l. Mouth shifted caudad and bordered by several similarly formed somites; prostomium often appearing as a dorsal caruncle extending over several somites ....*Amphinomoidea.*

m. Branchiae none......................................*Spintheridae.*

mm. Branchiae present.

n. Setae and arborescent branchiae forming a broad band on each side of the dorsum over its entire length, leaving naked only a narrow stripe along the middle............................*Euphrosynidae.*

nn. Branchiae and setae not forming such broad dorsal bands. *Amphinomidae.*

ll. Mouth not thus shifted back and bordered by several similar somites; prostomium not forming a dorsal band or caruncle; branchiae never in connection with parapodia.

m. Integument roughened, strongly papillose; with numerous short branchiae on peristomium..........................*Chlorhaemidae.*

mm. Integument smooth or at least not papillose; branchiae none.

n. Cirri flattened, foliaceous, and usually containing conspicuous mucus glands.

o. Cirri fastened near their middles, elytriform. Prostomium conical and with a single median process; no eyes; fused with the peristomium which bears a pair of cirri........*Typhloscolecidae.*

oo. Cirri not elytriform; prostomium not fused with the peristomium; eyes present................................*Phyllodocoidea.*

p. Eyes very large; nuchal organs rudimentary or absent; uniformly five tentacles present; tentacular cirri three or five pairs; pelagic forms..........................*Alciopidae.*

pp. Eyes small or but moderate, as in most polychaetes, or rarely none; nuchal organs well developed.

q. Proboscis with two pairs of true jaws; two pairs of tentacles; no palpi; one pair of tentacular cirri........*Lacydoniidae.*

qq. Proboscis without true jaws, being either wholly unarmed or with a number of small chitinous pieces or denticles.

r. A pair of palpi present; tentacles none or a single pair; exclusively pelagic forms.

s. Tentacles none; parapodia normal.. ....*Iospilidae.*

ss. A pair of tentacles present; parapodia greatly elongate. *Pontodoridae.*

rr. With no palpi.

s. Tentacles two pairs and in addition often an unpaired tentacle present; eyes and composite setae nearly always present.......................*Phyllodocidae.*

ss. Tentacles three; eyes none; setae all simple..*Otopsidae.*

nn. Cirri not flattened or lamellar and not containing conspicuous mucus glands.

o. Palpi massive, two-jointed, with the terminal article small, inserted well caudad of the pair of tentacles; proboscis consisting of two distinct rings, the distal one of which always bears a pair of maxillae curved toward each other and toothed on the mesal edge; cirri and tentacles simple.....................*Nereidae.*

oo. Palpi either absent, or when present inserted nearly at the same level as the tentacles, and when biarticulate with the terminal article conspicuously long; proboscis not divided into two such rings and bearing stout maxillae of this character; cirri and tentacles commonly in whole or in part composed of separate articles, annulated or moniliform..................*Sylloidea.*

p. Body commonly filiform and most often colorless; palpi never biarticulate; tentacular cirri one or two pairs. . . . . . *Syllidae.*

pp. Body typically short and plump and consisting of from twenty to forty somites, rarely more, and often conspicuously colored; palpi usually evidently, biarticulate; tentacular cirri from six to eight pairs, rarely two pairs or none. . . . . *Hesionidae.*

aa. Prostomium more or less completely hidden by the peristomium; palpi greatly developed and subdivided to form branchiae.

Body subdivided into thorax and abdomen, with the notopodia of the abdomen bearing uncini.

b. With a pair of well-developed tentacles; peristomium very strongly developed and forming a bilobed hood each lobe of which bears two or three semicircles of peculiar, stout, usually golden yellow, setae or paleae, or these rarely almost obliterated; thorax of five or six somites. *Sabellariidae.*

bb. Tentacles very small; peristomium not of this form and without cirri or setae. . . . . .*Serpuloïdea.*

c. Nearly always with a well-developed thoracic membrane, formed by the fusion of cirri, and an operculum; tube formed of mucin impregnated with calcareous matter, opaque, or rarely translucent. . . . .*Serpulidae.*

cc. Without thoracic membrane and operculum; tube formed of mucin of variable consistence and more or less transparent, strengthened or not with mud, sand, pieces of shell, or other foreign material. . . . .*Sabellidae.*

AMPHINOMIDAE.

The members of this family have most commonly an elongate body more or less tetragonal in cross-section, less commonly depressed and subelliptic in outline. Colors nearly always brilliant, often showing as shades of green, scarlet, violet, or yellow.

The prostomium is rounded and is bordered or almost surrounded by the first somites. It bears a pair of palpi and one, three or five tentacles and may or may not bear a dorsal caruncle or nuchal body. Eyes normally four but sometimes two or wholly absent.

The mouth is ventral in position and is somewhat removed from the anterior end, being bordered by a number of the anterior somites.

Parapodia biramous, with one or two dorsal cirri and one ventral cirrus on at least part of them, though these may be rudimentary or absent on others. Branchiae present, each a single, mostly arborescent or pennatifid tuft, never in transverse series.

Setae simple, capillary or sometimes as stouter hooked spines; in part calcareous and as a result very brittle.

Pygidium with one or two processes which are but little developed; anus dorsal, commonly large.

Proboscis protrusible, bearing neither jaws, teeth, or papillae.

The amphinomids, while occurring in the colder regions, apparently attain their largest development in warmer parts of the world, such as the Polynesian area, where they abound on the coral reefs, in the Philippines, and in the West Indies. They occur especially in the littoral zone and at moderate depths, though they have been taken as far down as 1525 fms. (*e. g.*, *Chloenea atlantica* McIntosh. See Challenger Annelida, 1885). These animals are sluggish in movement, showing a marked tendency toward a sedentary and in some cases a parasitic life, and concealing themselves in retreats which they rarely leave. Many species live in large part upon sponges, among which they hide. They also eat diatoms and radiolarians and other forms occurring in fixed localities. The nutritive value of the food being low necessitates the ingestion of an exceptional quantity and this is correlated with an anal opening of unusual size. (*Cf.* Gravier, Nouv. arch. Mus. hist. nat., 1901, ser. 4, **3**, p. 239). Some forms are frequently found attached to floating wood or other objects far from land. Such a form is notably *Amphinome vagans* Savigny (p. 27), which has been taken in drift in various parts of the Pacific and Atlantic Oceans.

The Amphinomidae (*sens. str.*) have not been represented in the collections of the important exploring expeditions by large numbers of species excepting in those of the SIBOGA in which Horst found no fewer than twenty-two species. Grube mentions five species from the Philippines in the Annulata Semperiana, listing four secured by the GAZELLE, and three in the Annulata Oerstediana. The CHALLENGER secured nine species, this comparatively small number being attributed by McIntosh to the fact that but little littoral collecting was done. But, on the other hand, in the large collection of annelids secured by the Hamburg expedition to southwestern Australia and coming almost exclusively from the littoral zone or from moderate depths, there are but two species of amphinomids, while Ehlers in his Neuseeländische Anneliden lists none at all, as is also the case in that author's report on the polychaetes of the Hamburger Magalhaenische Sammelreise. Ehlers gives two species as found on the Patagonian shores, and includes five in his Florida annelids. Of the polychaetes collected by the BLAKE in the West Indies, Augener lists three species as belonging to this family. In the ALBATROSS collection from the Hawaiian Islands (1902) Treadwell found five amphinomids. In his Polychaeta of the Indian Ocean Potts lists thirteen species. Izuka mentions but three species as known from Japan, and McIntosh in his monograph of British annelids includes but two. In the present collection there are five species, of which two are widespread and well-known forms, two uncommon, and one new.

Key to Genera.

a. Branchiae arborescent.
b. With no caruncle.
c. Branchiae only on the anterior somites; dorsal and ventral cirrus present on the first parapodia, rudimentary on others . . . . *Paramphinome* Sars.
bb. With a caruncle.
c. Caruncle much reduced.
d. Neuropodial setae bifurcate.
e. Caruncle of three small lobes in a transverse row, not extending beyond the first somite and preceded by a median tentacle; eyes none . . . . *Benthoscolex* Horst.
ee. Caruncle a flexuous crest with short lateral folds, reaching third or fourth somite; eyes present . . . . *Eurythoe* Kinberg.
dd. Neuropodial setae not bifurcate, simply hooked.
Caruncle tongue-shaped or cordiform; notopodial setae partly serrate along two sides, harpoon-shaped, partly more elongate, spinose . . . . *Amphinome* Bruguière.
cc. Caruncle well developed.
d. With dorsal cirrus single.
e. Caruncle without crest or folds, a few transverse grooves, narrowed caudad; eyes none. *Sangiria* Horst.
ee. Caruncle not so.
f. Caruncle very large, heart-shaped, with the lateral branches diverging caudad. *Pherecardia* Horst.
ff. Caruncle of more moderate size, not cordate.
g. Caruncle with lateral branches diverging cephalad . . . . *Hermodice* Kinberg.
gg. Caruncle not so.
h. Dorsal setae harpoon-like, a double series of retrorse teeth; caruncle with lateral branches diverging caudad . . . . *Pherecardites* Horst.
hh. Dorsal setae simply bifurcate; caruncle weakly transversely plaited, true lateral branches not evident; branchiae small, with few filaments . . . . *Parachloeia* Horst.
dd. With a dorsal and an intermediate cirrus . . . . *Notopygos* Grube.
b. With no caruncle . . . . *Hipponoe* Audouin and Edwards.
bb. With a caruncle.
c. With a single dorsal cirrus.
d. Eyes present; neuropodial setae smooth . . . . *Chloeia* Savigny.
dd. No eyes; neuropodial setae coarsely serrate along inner border . . . . *Bathychloeia* Horst.
cc. With a dorsal cirrus and an intermediate cirrus . . . . *Chloenea* Kinberg.

Synonymy of Genera.

Didymobranchus Schmarda is too imperfectly known at present to be placed with certainty. Eucarunculata Malaquin and Dehorne (1907) is synonymous with Pherecardia Horst (1886). Cryptonota Stimpson and Oniscosoma Sars are the same as Spinther Johnston, type of the amphinomoid family Spintheridae, not represented in the present collection.

NOTOPYGOS Grube.

Archiv. naturg., 1855, **21**, p. 93; Annulata Semperiana, 1878, p. 7.
Lirione KINBERG, Öfvers. K. vet. akad. Förh., 1857, **14**, p. 12.

Notopygos was used by Grube in 1850 in his Übersicht der annelidengattungen und arten (p. 21) but without mention of any species, and again in 1851 in his Familien der anneliden (Archiv. naturg., **16**, p. 40); but as he gave no diagnosis either for the genus or its type-species at that time, the genus must date from 1855.

NOTOPYGOS MACULATA (Kinberg).

Lirione maculata KINBERG, Öfvers. K. vet. akad. Förh., 1857, **14**, p. 12; BAIRD, Journ. Linn. soc. London. Zool., 1868, **10**, p. 226; KINBERG, Fregatt. Eugenies Resa Zool. Annulater, 1910, pl. 11, f. 5–5x.
Notopygos maculata GRUBE, Annulata Semperiana, 1878, p. 8, pl. 1, f. 3; MALAQUIN & DEHORNE, Rev. Suisse zool., 1907, **15**, p. 357.

LOCALITY. Panama: Taboguilla Island. 31 October, 1904. One specimen taken on the shore. It is only about 10 mm. in length, or half that of the type, and is evidently not in full color. The specimen is topotypical, Kinberg stating of the type "Hab. oras insularum juxta Panama."

HERMODICE Kinberg.

Öfvers. K. vet. akad. Förh., 1857, **14**, p. 12.

HERMODICE STRIATA Kinberg.

Öfvers. K. vet. akad. Förh., 1857, **14**, p. 13.
Hermodice pennata TREADWELL, Bull. U. S. fish comm., 1903, **23**, pt. 3, p. 1165.

LOCALITY. Society Islands: Papeete. 9 November, 1899. Two specimens taken on the shore.

These specimens, the larger of which is complete and 23 mm. in length, agree fully with the original description. The type was also from the Society Islands, having been taken on the coral reef at Eimeo. The somites are conspicuously marked above by longitudinal stripes of brownish pink which extend part way or entirely across each somite. The distal end of the notopodia is encircled with dark. The setae are whitish. The setae agree in structure with Kinberg's account. The head, tentacles, caruncle, and cirri have the characteristic structure described by Treadwell for his *H. pennata* which seems without doubt to be the same species.

AMPHINOME Bruguière.

Encyclop. méthod., 1789, **1**, p. viii, 44; 1791, **7**, p. 88; CUVIER, Dict. sci. nat., 1804, **2**, p. 3113; HORST, Siboga exped. Monog. 24a, 1912, p. 39.
Pleione SAVIGNY, Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 14, 59; CUVIER, Règne anim., ed. 2, 1829, **3**, p. 199.

Amphinoma Blainville, Dict. sci. nat., 1828, **57**, p. 450; Audouin & Milne Edwards, Hist. nat. litt. France. Annélides, 1834, **2**, p. 121.
Linopherus Quatrefages, Hist. nat. annelés, 1865, **1**, p. 392.
Lenora Grube, Annulata Semperiana, 1878, p. 2.

Amphinome vagans (Savigny).

Pleione vagans Savigny, Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 60.
Amphinoma vagans Blainville, Dict. sci. nat., 1828, **57**, p. 451; Audouin & Milne Edwards, Hist. nat. litt. France. Annélides, 1834, **2**, p. 122.
Amphinome vagans Grube, Archiv. naturg., 1850, **1**, p. 289; Kinberg, Öfvers. K. vet. akad. Förh., 1857, **14**, p. 12; Quatrefages, Hist. nat. annelés, 1865, p. 403; Baird, Journ. Linn. soc. London. Zool., 1870, **19**, p. 218; McIntosh, Challenger Annelida, 1885, p. 24; Horst, Notes Leyden mus., 1886, **8**, no. 3, p. 159; Kinberg, Fregatt. Eugenies Resa. Zool. Annulater, 1910, p. 34, pl. 11. fig. 6.
Pleione tetraedra Milne Edwards (nec Savigny), Règne anim. illust. Annélides, 1849, pl. 8, fig. 1, 1a.
Amphinome rostrata Kinberg (nec Pallas), Öfvers. K. vet. akad. Förh., 1857, **14**, p. 12; McIntosh, Challenger Annelida, 1885, p. 21, pl. 1A, fig. 16, pl. 2A, fig. 8–12; Andrews, Proc. U. S. N. M., 1891, **14**, p. 278; Izuka, Journ. Coll. sci. Imper. univ. Tokyo, 1912, **30**, p. 226, pl. 1, fig. 2, pl. 22, fig. 6–9.
Amphinome pallasii Quatrefages, Hist. nat. annelés, 1865, p. 394; Baird, Journ. Linn. soc. London. Zool., 1870, **19**, p. 218; Ehlers, Mem. M. C. Z., 1887, **15**, p. 26, pl. 1, fig. 4; Moore, Proc. Acad. nat. sci. Philad., 1903, p. 793; Fauvel, Résul. campag. sci. Prince Monaco, 1914, **46**, p. 85.

Localities. Off Marquesas Islands. Sta. 3686 (lat. 12° 20′ S; long. 144° 15′ W.). Surface temp., 79° F. 19 September, 1899. One specimen 22 mm. long taken on barnacles drifting at surface.

Off Acapulco Light House, Mexico. Sta. 4596 (lat. 16° 48′ N., long. 100° 27′ W.). Surface temp., 84° F. 14 October, 1904. Six immature specimens ranging in size from only 2.5 mm. to 8.5 mm. were taken from driftwood.

This species has often been taken similarly from driftwood elsewhere in the Pacific as well as in the Atlantic. The specimens recorded agree in details of structure of the setae and other parts with specimens from the Atlantic excepting, in the case of those from the second locality, in slight points such as the difference in size and form of the knob on the shortest setae, differences possibly due to immaturity. The largest of the specimens from Sta. 4596 has twenty-five somites, the smallest seventeen, the most caudal of these being short and closely crowded.

The forms that have usually been referred to *A. vagans* seem without doubt to be partly grown specimens of the same species known as *A. pallasii* and, in part, as *A. rostrata.* The true *rostrata* is a species occurring in the Indian Ocean and differing from the Atlantic and Pacific form that has been listed under that name; *vagans* has priority over *pallasii.*

Eurythoe Kinberg.

Öfvers. K. vet. akad. Förh., 1857, **14**, p. 13.

EURYTHOE COMPLANATA (Pallas).

Plate **14**, fig. 3–8

Aphrodite complanata Pallas, Misc. zool., 1766, p. 109, pl. 8, fig. 1926.
Pleione complanata Savigny, Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 62.
Pleione alcyonia Savigny, Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 62, pl. 2, fig. 3.
Eurythoe pacifica Kinberg, Öfvers. K. vet. akad. Forh., 1857, **14**, p. 14; Grube, Novara Annelid., 1867, p. 8; Monatsb. K. preuss. akad. wiss. Berlin, 1877, p. 509; Annulata Semperiana, 1878, p. 6; McIntosh, Challenger Annelida, 1885, p. 27; Malaquin & Dehorne, Rev. Suisse zool., 1907, **15**, p. 357; Kinberg, Fregatt. Eugenies Resa. Zool. Annulater, 1910, pl. 12, f. 11.
Eurythoe kamehamecha Kinberg, Öfvers. K. vet. akad. Förh., 1857, **14**, p. 14; Ehlers, Zool. jahrb. Syst. 1905, **22**, 3, p. 281; Kinberg, Fregatt. Eugenies Resa. Zool. Annulater, 1910, pl. 12, f. 13.
Eurythroe corallina Kinberg, Öfvers. K. vet. akad. Förh., 1857, **14**, p. 14.
Eurythoe complanata Langerhans, Nova acta Acad. Caesareae Leop. Carol., 1881, **42**, p. 108. Ehlers, Mem. M. C. Z., 1887, **15**, p. 29; Nach. K. gesellsch. wiss. Göttingen, Math. phys. klasse, 1897, p. 159; Festsch. K. gesellsch. Göttingen, 1901, p. 34; Treadwell, Bull. U. S. fish comm., 1901, **20**, pt. 2, p. 194; Collin, Polych. Amboina etc., 1902, p. 99; Ehlers, Zool. jahrb. Syst., 1905, **22**, 3, p. 281; Deutsch. tiefsee exped. Valdivia, 1908, **16**, p. 38; Potts, Polych. Indian Ocean, 1909, pt. 1, p. 367; Horst, Siboga exped. Monog. 24a, 1912, p. 34, pl. 9, fig. 20; Augener, Fauna Südw.-Austr. Polych., 1, 1913, **4**, 4, 6, p. 87.
Eurythoe pacifica var. *levukaensis* Fischli, Abh. Senck. naturf. gesellsch. Frankfurt-a-M., 1900, **25**, p. 98.
Eurythoe alcyonia Gravier, Nouv. arch. Mus. hist. nat., 1901, ser. 4, **3**, p. 248.

Localities. Paumotu Archipelago: Rangiroa. 23 September, 1899. Three small specimens.

Paumotu Archipelago: Fakarava. 13 October, 1899. Eighteen specimens taken on the fringing reef, a few of these being immature.

Paumotu Archipelago: Makemo. 21 October, 1899. Numerous young specimens.

Society Islands: Papeete. 9 November, 1899. Shore. Two small specimens.

Society Islands: Bora Bora. 17 November, 1899. Fringing reef. Numerous young and partly grown specimens.

Easter Island. 20, 21 December, 1904. Three specimens from the shore.

Galapagos Islands: Chatham Island. 8, 9 January, 1905. Shore. Three specimens.

Eurythoe complanata as here accepted has an almost cosmopolitan distribution in the warmer latitudes. It is abundant and very widespread on the coasts of the Indo-Pacific region from East Africa and the Red Sea to the Philippines, Hawaiian Islands and the Galapagos, without, however, having been taken on the western American coast, and it occurs as well in the Atlantic in the West Indies and on the African coast at the Canaries, etc. On the west coast of America it is represented by a smaller but very closely related form, *E. paupera* Grube (*E. californica* Johnson) which occurs in the littoral zone from Patagonia northward to California. It seems to be extremely abundant on the coral reefs of the Pacific Islands. *E. complanata* was described originally from the West Indies, *E. alcyonia* from the Red Sea, and *E. pacifica* from the Society Islands (Eimeo); but the forms identified by different writers under these three names overlap extensively in their ranges and at the same time present no distinctive morphological characters that have been thus far pointed out. Slight differences in the setae occur in specimens from many different localities; and it is quite likely that after the minute study of abundant material it will be possible to limit various local varieties; but such discrimination seems impossible in the present state of our knowledge. I do not find that the supposedly characteristic serrations of the furcate setae of dorsal and ventral fasciae in *E. pacifica* are present even in most specimens from the general type-locality. *E. corallina* Kinberg I regard as having been based upon young specimens of this species, the number of buccal segments having been found to vary with age.

Specimens from all the localities mentioned agree in general form and proportions, the body having a flattened form of subrectangular cross-section about twice as wide as high. The oval prostomium has four eyes; the tentacles are short, with the median shorter than the lateral and scarcely as high as the adjacent caruncle. The caruncle does not extend beyond the fourth segment. There are three or four buccal segments. Both the dorsal and the ventral cirri are shorter than the setae and are jointed. Notopodial setae include besides the prevalent straight serrate type, a very slender furcate type, the branches of which are fine. The neuropodial setae are of a much stouter furcate type in which the branches are stout. In both furcate types serrations may or may not be present. While the setae vary obviously in form, it does not seem possible at present to define varieties or subspecies on this basis. (See Plate **14**, fig. 3–9).

The specimens from the Galapagos conform in the features above mentioned. The midventral line is dark as in many specimens from the Paumotus, etc.; but, in addition, there is a slight darkening in a narrow band adjacent to the parapodia both above and below. The dorsal surface is more strongly sulcate and roughened than usual. The smallest specimen is 53 mm. long and 6 mm. wide, exclusive of the setae. It is composed of seventy somites. The intermediate specimen is nearly 100 mm. long, has a maximum width of 11 mm. and embraces one hundred and two somites. The third specimen is much larger and greatly exceeds other specimens of the species of which I find measurements recorded, and presents a correspondingly large number of somites. It is

350 mm. long, has a maximum width, exclusive of setae, of 15.5 mm. and inclusive of setae of 20 mm. It consists of one hundred and eighty-four somites or near that number.

CHLOEIA Savigny.

Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 58.
Cloeia SAVIGNY, Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 14.

CHLOEIA ENTYPA, sp. nov.[1]

Plate **13**, fig. 8, 9; Plate **14**, fig. 1, 2.

The general color of the body is yellowish throughout; the setae a brighter, uniform yellow; the dorsal cirri deep violaceous or purplish, becoming more dilute distad.

The body is narrower caudad, being narrowly obovate in outline. The length is near 10 mm. and the greatest width, exclusive of the setae, is about 4.2 mm.; the longest setae measure 3.2 mm. There are twenty-three or twenty-four somites (or twenty without the cauda).

The anterior paired tentacles are widely separated at the base; they are paler in color and about two thirds as long as the posterior ones. The posterior paired tentacles are inserted close together immediately in front of the anterior end of the caruncle; they are shorter than the median tentacle which in turn is only about half as long as the caruncle. All the tentacles are of the usual subulate type. None has any dark pigmentation.

The elevated caruncle is attached in front to the first two somites but extends caudad to the fifth where it ends freely. It narrows continuously from the anterior end to the posterior. It is doubly crenate or foliate as usual, there being in the type eight to ten pairs of foliae. The color is yellow throughout with no dark markings.

The mouth is a simple opening. From it there extends forward and about the anterior end the usual two connate palpal ridges. It ends at the third somite which on the ventral side is longest at the middle with the median region longitudinally wrinkled.

The typical segments of the body have the usual general structure. Ventrally the somites show many longitudinal impressed sulci and along the midventral line a sharply defined, wide, depressed band or neural channel.

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[1] ἔντυπος, impressed.

The branchiae are large. Each one normally extends caudad much as in *C. maculata* Potts, but is much longer, typically overlapping the succeeding somite and branchia. The branches from the main trunk of the branchia are relatively long and numerous; they may bear a few secondary branches or pinnulae but the more distal ones are more commonly simple.

The dorsal cirri are very conspicuous because of their strongly contrasting deep violaceous color. Each is attached caudad of the notopodial tubercle as usual. They are distally slenderly subulate and in the preserved specimen are shorter than the long ventral setae. The ventral cirri are pale throughout and are slenderly subulate. Each is attached on the caudoventral side of the ventral fascia.

The dorsal setae are distinctly coarser than the ventral. The prevailing type is moderately curved and has the furcate apical part more or less at an angle with the proximal division. The larger distal branch is long and acute, the shorter branch or spur being parallel with it excepting the tip which curves slightly outward or away from the axis. (Plate **13**, fig. 8). The principal branch is prevailingly smooth along both edges. A second type occurs in the middle and especially the posterior region. The setae of this type are coarser. The outer edge of these setae is very finely serrulate, the teeth being minute and occurring chiefly on the distal half. (Plate **14**, fig. 1). None of the setae show such coarse teeth as occur for instance in *C. flava* (Pallas). Only one form of setae was observed in the ventral fasciae. These are finer and longer than the dorsals. In the furcate tip of these setae the main branch is straight and slender with the edges smooth. The spur is short and straight and a little divergent. (Plate **13**, fig. 9).

Locality. Off Mexico. Sta. 3418 (lat. 16° 31′ N., long. 99° 52′ 30″ W.). Depth, 66 fms. Bottom, brown sand with black specks. Bottom temp., 39° F. Exped. 1891.

One specimen. The depth is exceptional for the genus.

In general structural features this species approaches the widespread *C. flava* (Pallas), though it is a much smaller form with correspondingly fewer somites. It has the similar conspicuous, purplish brown, dorsal cirri arising from a non-pigmented base, but lacks the other dark markings so conspicuous in *flava* and does not present the more brightly yellow tips to the setae. The branchiae and setae differ clearly from those of *flava* in details of form and structure.

Euphrosynidae.

These are forms of small or medium size in which the body is oblong or elliptic, with the dorsum in some degree arched and the venter flattened. The number of somites is comparatively small, being mostly between twenty and sixty.

The prostomium is small and compressed and bends down anteriorly to the ventral surface. It bears typically four eyes, two dorsal and two ventral, and three tentacles, a median and two lateral ones arising ventrally, or rarely no tentacles present (Lophonta). Palpi adnate at border of mouth. A caruncle present, distinct.

Mouth ventral, extending over several somites.

Parapodia with rami fused and extending as a transverse ridge upon the dorsum toward the median line, the ridge bearing setae and branchiae. A ventral cirrus and from one to three dorsal cirri present. The branchiae on the dorsal extension of the parapodia are arranged in transverse series, in such manner that with the accompanying setae they leave free only a narrow median longitudinal band. The branchiae are branched, pennatifid, or arborescent.

Setae simple, the ventral ones commonly unequally and conspicuously bifurcate distally. Dorsal setae rarely replaced by stout paleae.

Pygidium with two processes or an undivided rim.

The euphrosynids may occur at considerable depths, but are most frequent in the littoral region as with the amphinomids.

The genus Lophonta of Costa is insufficiently known. It is placed with Euphrosyne tentatively because of the arrangement of the gills in transverse series.

Key to Genera.

a. Tentacles absent..*Lophonta* Costa.
aa. Tentacles present.
  b. Only one dorsal cirrus; dorsal setae in the form of large flat paleae....*Palmyreuphrosyne* Fauvel.
  bb. Two (or three) dorsal cirri present; dorsal setae not thus modified....*Euphrosyne* Savigny.

Euphrosyne Savigny.

Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 63; Audouin & Milne Edwards, Hist. nat. litt. France. Annélides, 1834, **2**, p. 124; Ehlers, Borstenwürmer, 1864, p. 64; Grube, Annulata Semperiana, 1878, p. 11; McIntosh, British annelids, 1900, **1**, pt. 2, p. 233.

Euphrosine Cuvier, Regne anim. ed. 2, 1829, **3**, p. 199; Blainville, Dict. sci. nat., 1828, **57**, p. 199.

EUPHROSYNE PANAMICA, sp. nov.

Plate 12, fig. 7, 8; Plate 13, fig. 1–7.

The general color of the type is at present yellowish gray.

The body in outline is oblong with the anterior end rounded; narrower from the middle caudad, with the caudal end also rounded; the sides of the anterior region between the middle and the convex anterior end are straight and parallel or nearly so. The total length of the type is nearly 14 mm. and the greatest width over all 6.5 mm. The number of setigerous somites counted in the type is thirty-five. The naked median dorsal stripe is narrow, being only about one sixth the total width in the median region or one fourth excluding the setae. The stripe is smooth.

The caruncle is a slender smooth finger-like or cirriform process projecting freely caudad, crossing the fifth somite and in the type touching the anterior border of the sixth. It is acuminate caudad. The unpaired tentacle presents the usual slender, thread-like distal article; it scarcely reaches caudad of the middle of the caruncle when laid along the latter. The paired tentacles are much longer than the median and are of about the same thickness and general form as the caruncle and lack a terminal filament; they reach three fourths the distance to the caudal end of the caruncle when laid back along the latter.

On the ventral surface of the head the palpi together form a heart-shaped cushion with the tip forwards. This cushion is longitudinally divided by a deep furrow. Its surface is wholly smooth. It is bordered by the first and second somites and is touched caudally by the third.

The median fold of the lower lip is cordate in outline with the apex directed caudad. It is much smaller than the lobe formed by the palpi. The apex extends to the middle of the fifth somite. The lobe is crossed by distinct radiating furrows. It is bordered by part of the third and the fourth somites, while its apex extends into the fifth.

The branchiae are short, the long setae projecting much beyond their distal ends though not so the shorter ones. On each side of each somite there are for the most part twelve branchiae. The branchiae in each row are closest together at the ectal end of the series and the space between the first and second from the mesal end of the series is distinctly larger than that between any other two. Each branchia presents a short stout trunk which divides typically into two branches which bear the many terminal twigs, each of which ends in a conspicuous bud-like expansion which is drawn out into an acute point. The branches of adjoining branchiae intermingle so that when a series is viewed from above only a continuous brush-like band appears, the separate branchiae not being distinguishable in dorsal view.

The cirri are simple thread-like structures which do not surpass the branchiae in length. The dorsal and lateral or intermediate cirri are similar. The lateral dorsal cirrus is inserted opposite the fourth (or third?) branchia.

The dorsal setae extend in transverse series parallel with the row of branchiae entirely across the dorsal ridge to the outermost branchia and are not separated by any distinct empty space from the lateral setae. The principal dorsal setae rise clearly above the tops of the branchiae. Each is forked in the usual way. The principal prong is long and straight or with a weak double curve. The smaller branch curves a little outward. (Plate 12, fig. 3). Both prongs are wholly smooth. In a second type of dorsals the setae are similar excepting for being shorter and finer. (Plate 13, fig. 4). In addition there are characteristic short dorsal setae which are strongly clubbed at the distal end. In these the distal enlargement is cleft from one side in a plane that curves caudad, separating a lower lobe with convex inner face from an upper one with concave inner surface. The inner surface of each of these lobes is transversely ridged along each border. (Plate 12, fig. 7; Plate 13, fig. 1, 2). Somewhat similar setae exist in *E. triloba* Ehlers and in *E. myrtosa* (Savigny). The upper ventral setae are as long as the dorsals, the lowermost much shorter. They are similarly furcate but are rather more slender. As with the dorsals, no teeth occur on the prongs. In the shorter ventral setae the principal prong may have but a single weak curve, or it may be straight and acute; while the minor prong may be reduced to a minute acute tooth. (Plate 13, fig. 5, 6).

LOCALITY. Panama: Perico Island. Shore. 26 October, 1904. Two specimens.

This species in the general character and number of its branchiae approaches *E. capensis* Kinberg. The latter is larger (40–50 mm.) with a much larger number of somites (between fifty and sixty). The ventral setae have their prongs serrate instead of wholly smooth. The caruncle is longer, extending over eight somites instead of only five. That species would seem also to lack the characteristic clavate dorsal setae. The present species also has close similarities to *E. limbata* Moore; but in the latter there is but one type of setae, the peculiar cleft clavate form being absent and the branchiae seem not to have the conspicuous, bud-like terminal enlargements.

POLYNOIDAE.

In this family the body is flattened and narrow with the sides nearly parallel, or else broader and oval and elliptic and in other cases elongate and more typically vermiform.

Prostomium distinct, convex. Facial tubercle absent or weakly developed. Eyes four. Two lateral tentacles and in most cases also a median tentacle present. Palpi present, elongate.

First somite, or peristomium, bearing usually setae in reduced number. Two pairs of elongate cirri, the ventral cirrus of the succeeding somite also ordinarily very elongate.

Parapodia biramous with ventral cirri and dorsally in part notocirri and in part elytra. Elytra borne on somites II, IV, V, VII and so on, on the odd somite to the twenty third, after which, when elytra occur at all, two cirriferous somites are ordinarily intercalated between two bearing elytra; more rarely the anterior ones on II, IV, VI, VIII, and X. (Hemilepidia).

Setae all simple. Dorsal setae with simple or bifid and more or less hooked tips.

Pygidium with two anal cirri.

Proboscis distally with a single circle of equal papillae; armed with four horny jaws.

The polynoids live under a great variety of conditions, some at considerable depths, but the greater number in shallower water along the shores, among Algae, growths of eel-grass (Zostera), bryozoans, and hydroids, such being various species of Lepidonotus, Polynoe, Halosydna, etc. In contrast with the sluggish movements of most, some swim freely and with considerable agility and gracefulness, *e.g.*, *Halosydna gelatinosa* M. Sars. (Gravier, Nouv. arch. Mus. hist. nat., 1901, ser. 4, **3**, p. 206) and a few forms, such as *Drieschia pelagica* Michaelsen, Nectochaeta, and Plotolepis, gen. nov., are pelagic. Many are commensals, different forms living in association with sponges (*e.g.*, *Lagisca hexactinellidae* and *Polynoe euplectellae* occurring in *Euplectella aspergillum* and having a corresponding remarkable transparency); coelenterates (*e.g.*, *Polynoe rutilans* Grube, occurring on and matching in color an alcyonarian, Xenia); starfishes, many polynoids placing themselves in the ambulacral grooves near the mouth and apparently there securing fragments of food escaping the starfish (*e.g.*, the well-attested case of *Acholoe astericola* Delle Chiaji occurring on *Astropecten aurantiacus* (Linné), *A. bispinosus* (Otto), *A. irregularis* (Pennant), and probably others, *Harmothoe lunulata* also occurring on the latter); ophiurans (*e.g.*, *Scalisetosus communis* on *Ophiothrix alopecurus* Müller & Troschel and *O. fragilis* (Abild.)); sea-urchins (*e.g.*, *Scalisetosus echini* on *Echinus esculentus* Linné to which it presents a clearly mimetic resemblance and *Hololepidella commensalis* Willey on *Clypeaster humilis* Ceylon pearl oyster fisheries report, 1905, pt. 4, p. 251); holothurians (*e.g.*, *Lepidasthenia pulchra* Johnston on *Stichopus californicus* (Stimpson) which it matches in color); molluscs (*e.g.*, this same *Lepidasthenia pulchra* occurring in the cavity between mantle and foot in *Lucapina crenulata*); other annelids, this group and that of the echinoderms being the ones which bear polynoids in greatest numbers, these having been noted in association with serpulids, terebellids, arenicolids, chaetopterids, cirratulids and even eunicids, an interesting case being that noted by Webster in which *Harmothoe parasitica* lives under the elytra of *Lepidametria commensalis* which in turn is itself parasitic on *Amphitrite ornata* (Trans. Albany institute, 1879, p. 9); Enteropneusta (*Lepidasthenia digueti* Gravier in association with a Balanoglossus from the Gulf of California *cf.* Gravier, Bull. Soc. philom., 1905, ser. 9, **7**, pt. 3, p. 160); and tunicates (*e.g.*, *Herdmanella ascidioides* McIntosh), in the branchial chamber of an ascidian, probably a Styela, see Darboux, Bull. sci. France & Belgique, 1900, **30**, p. 11, etc.).

As with the aphroditids, the polynoids frequently themselves bear various other animals, including protozoans, sponges, coelenterates, bryozoans, other annelids, and Crustacea, some members of which seem to be the parasites most common (*e.g.*, species of Selius, Silenium, and Selioides, see St. Joseph, Ann. sci. nat., 1888, ser. 7, **5**, p. 141).

Like other aphroditoids, the polynoids are carnivorous, feeding upon such forms as sponges, hydroids, other annelids and crustaceans and more rarely small molluscs.

Of very great interest in the present ALBATROSS collection are the pelagic members of the Polynoidae which add four species, including three new genera, to the six species previously known. The ten forms are as follows:—

1. *Polynoe pelagica* Viguier Arch. zool. expér., 1886, ser. 2, **4**, p. 416. Mediterranean.
2. *Polynoe innatans*, sp. nov. Eastern south Pacific.
3. *Nectochaeta grimaldi* Marenzeller, Bull. Soc. zool. France, 1892, **17**, p. 183. North Atlantic.
4. *Harmopsides natans*, gen. et sp. nov. Coast of Peru and at several stations northward to the latitude of Central America.

5. *Drieschia pelagica* Michaelsen, Jahrb. Hamb. wiss. anstal., 1892, **9**, p. 6, fig. 15–18. Off Ceylon.

6. *Plotolepis nans*, gen. et. sp. nov. Pacific near Easter Island.

7. *Plotolepis pellucida* (Moore), Proc. Acad. sci. Phil., 1903, p. 794, pl. 50, fig. 1–12. From the Atlantic off Massachusetts.

8. *Podarmus ploa*, gen. et sp. nov. Pacific off Easter Island.

9. *Quetiera pelagica* Viguier, Ann. sci. nat., 1911, ser. 9, **13**, p. 252; 1912, ser. 9, **15**, p. 89, pl. 2, 3, f. 1–6. Mediterranean.

10. *Frenna dubia* Viguier, *op. cit.*, 1912, ser. 9, **15**, p. 94, pl. 2, 3, f. 11. Mediterranean.

Ehlers thinks it possible that his *Herdmanella gracilis* from off the African coast is a pelagic form; but this is uncertain as it was among forms secured at depths from 1,500 to 2,000 meters in the vertical net. (Deutsch. tiefsee-exped. Valdivia, 1908, **16**, p. 44, pl. 5, f. 1–4).

Key to Genera.

a. With only two tentacles.
b. With a facial tubercle; notopodial setae finer than the neuropodials.
c. Eyes present; elytra with surface in part papillose.................... *Iphione* Kinberg.
cc. No eyes; elytra smooth.. *Iphionella* McIntosh.
bb. No facial tubercle; notopodial setae coarser than the neuropodials........ *Bylgides*, nom. nov.
aa. With three tentacles.
b. Lateral antennae inserted at margin of prostomium.
c. Pelagic forms; these comparatively short, colorless and transparent; setae ordinarily conspicuously elongate or of a special natatory type.
d. Parapodia strictly uniramous, the notopodium represented by neither lobe, aciculum or setae.
e. Notocirri unequally developed, those of the anterior region and alternate ones in the posterior region decidedly elongate and more or less inflated.... *Plotolepis*, gen. nov.
ee. Notocirri not thus very unequally developed.
f. Setae of one type, fine, capillary, and long.
g. Neurocirri attached near the middle of neuropodium or proximad of it, the first elongate but all others very small, falling clearly short of attaining the distal end. *Quetieria* Viguier.
gg. Neurocirrus attached far distad of middle of neuropodium, the distal end of which it much surpasses.. *Frenna* Viguier.
ff. Setae of two forms, one long and fine and the other shorter and stouter, all with tips entire.
g. Parapodia all with a conspicuous, though short, cylindrical or somewhat clavate process from posterior surface just above insertion of neurocirrus; coarser ventral setae straight, nearly as long as the dorsals and equally as numerous. *Podarmus*, gen. nov.
gg. Parapodia with no such process from the caudal side; coarser ventral setae much fewer and very much shorter than the finer dorsals, and more or less sigmoidally curved.. *Drieschia* Michaelsen.
dd. Parapodia biramous.
e. With a median process or "subtentacular cirrus" beneath the median tentacle; no notopodial setae; pairs of elytra eighteen........................ *Harmopsides*, gen. nov.
ee. With no subtentacular cirrus; in each notopodium a stout seta in addition to the aciculum; pairs of elytra eleven.................................. *Nectochaeta* Marenzeller.

cc. Non-pelagic forms; these pigmented and more or less opaque; setae ordinary.

d. Elytra arranged in the usual manner in the family.

e. Somites more or less numerous, with the body long and vermiform; notopodia abortive, with its setae few or none; elytra commonly much reduced in size.

f. Ventral cirri bearing conspicuous wart-like tubercles............*Perolepis* Ehlers.

ff. Ventral cirri as usual, smooth.

g. Elytra occurring in pairs throughout.................*Lepidasthenia* Malmgren.

gg. Certain somites having an elytron on one side paired with a cirrus on the other. *Lepidametrea* Webster.

ee. Body mostly short and depressed, proportionately broader, and somites fewer.

f. First pair of elytra of normal size, all others exceedingly small; elytra twelve pairs; no notopodial setae....................................*Hermenia* Grube.

ff. Elytra not thus.

g. Median tentacle inserted dorsally.

h. Inserted on the anterior region of the prostomium; notopodial setae coarser than the ventrals..............................*Allmaniella* McIntosh.

hh. Inserted on the posterior region of prostomium.

i. Parapodia without notopodial setae...................*Admetella* McIntosh.

ii. Notopodial setae present, coarser than the ventrals.....*Macellicephala* McIntosh.

gg. Median tentacle inserted marginally.

h. With a subtentacular process or "cirrus"; dorsal setae coarser than the ventrals. *Eulagisca* McIntosh.

hh. With no such subtentacular process.

i. Notopodial setae finer than the neuropodials.

j. Prostomium anteriorly with distinct peaks which bear the lateral tentacles.

k. With vesicular expansions about bases of elytrophores and cirrophores; pairs of elytra twenty.....................*Physalidonotus* Ehlers.

kk. With no such vesicular expansions.

l. Elytra eighteen pairs or more....................*Halosydna* Kinberg.

ll. Elytra twelve or thirteen pairs.

m. Palpi short and blunt, exceeded by the tentacles; styles of lateral tentacles short and conical; eyes none......*Bathynoe* Ditlevsen.[1]

mm. Palpi and styles normal, tentacles not exceeding the former; eyes present.

n. Elytra thirteen pairs........................*Euphione* McIntosh.

nn. Pairs of elytra twelve.

o. Notopodial setae with series of pectinae.....*Lepidonotus* Leach.

oo. Notopodials of two kinds, one wholly smooth..*Thormora* Baird.

jj. Prostomium without such anterior peaks; elytra fifteen pairs. *Malmgrenia* McIntosh.

ii. Notopodial setae coarser than the ventrals.

j. Pairs of elytra eighteen, or more.

l. Neuropodial setae with apices bidentate; pairs of elytra eighteen. *Alentia* Malmgren.

ll. Neuropodial setae with apices entire; pairs of elytra twenty-one or twenty-two.....................................*Pseudohalosydna* Fauvel.

dd. Elytra arranged as usual anteriorly but occurring on all somites in the posterior region. *Hololepida* Moore.

bb. Lateral antennae inserted ventrally.

c. Body long and vermiform.

d. Elytra completely covering the body; notopodial setae finer than the ventrals. *Acholoe* Claparède.

dd. Dorsum in part uncovered.

e. Anterior elytra on somites 2, 3, 4, 6, 8, and 10.................*Hemilepidia* Schmarda.

ee. Anterior elytra as usual, on somites 2, 4, 5, 7, 9, and 11.

f. No notopodial setae; neuropodials with tips entire...........*Heteropolynoe* Bidenkap.

ff. Notopodial setae present.

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[1] The number of pairs of elytra not definitely stated by Ditlevsen for this genus, but presumably as in Lepidonotus. *Cf.* Danish Ingolf-Exped., 1917, **4**, pt. 4, p. 42.

g. Elytra fifteen pairs, all in the anterior region; notopodial setae commonly finer than the neuropodials.

h. Prostomium rounded anteriorly, without peaks............. *Enipo* Malmgren.

hh. Prostomium with anterior peaks.

i. Neuropodial setae distally bifid; notopodials with transverse rows of spines or pectinae... *Polynoe* Savigny.

ii. Neuropodial setae distally entire; notopodials simply serrate. *Nemidia* Malmgren.

gg. Elytra not thus confined to the anterior region; notopodials not finer than the neuropodial setae.. *Polyeunoa* McIntosh.

cc. Body short and more or less depressed, more rarely sublinear.

d. Dorsum normally completely covered with the elytra.

e. Median antenna inserted at the margin.

f. Parapodia uniramous... *Polynoella* McIntosh.

ff. Parapodia biramous.

g. Notocirri alternately short and long; dorsal setae stouter than the ventrals. *Kermadecella* Darboux.

gg. Notocirri all of the same length.

h. Notopodial setae of same thickness as the neuropodials....... *Intoshella* Darboux.

hh. Notopodials not of same thickness as the neuropodial setae.

i. Notopodials stouter than the neuropodials, or at least equal to them.

j. Notopodials smooth................................. *Meloenis* McIntosh.

jj. Notopodials with transverse rows of spines.

k. Body linear or sublinear; tips of neuropodial setae wholly straight, bifid, with the incision very fine....................... *Eucranta* Malmgren.

kk. Body elliptic or ovate oblong; tips of neuropodials obviously more or less curved, when bifid the teeth diverging.

l. Elytra sixteen pairs.............................. *Leucia* Malmgren.

ll. Elytra fifteen pairs.

m. Elytra smooth.............................. *Laenilla* Malmgren.

mm. Elytra granular or scabrous.

n. Anterior eyes situated on the peaks, small, ventral or subventral; peaks close to the median tentacle.......... *Harmothoe* Kinberg.

nn. Anterior eyes farther caudad, larger, lateral in position; peaks usually well separated from the median tentacle.

o. Neuropodial setae with tips entire.

p. Tips of neuropodials long and fine.......... *Antinoe* Kinberg.

pp. Tips of neuropodials short, not hair-like.

q. Head very broad; ceratophore of median tentacle extends between peaks caudad of middle of prostomium; anterior eyes much larger than the caudal.... *Phyllantinoe* McIntosh.

qq. Head not unusually broad, and ceratophore of median antenna not extending caudad of middle.... *Eunoe* Malmgren.

oo. Neuropodials with tips bifid.............. *Evarnella*, nom. nov.

ii. Notopodials finer than the neuropodial setae, typically in part thread-like distally.

j. Notopodials smooth................................ *Robertianella* McIntosh.

jj. Notopodials with transverse rows of spines.

k. Ventral setae with tips entire...................... *Gattyana* McIntosh.

kk. Ventral setae with tips bifid..................... *Paranychia* Czerniawsky.

ee. Median antenna not inserted at the margin.

f. Median antenna inserted dorsally.

Notopodial setae of same thickness as the finer of the ventrals, these being of two kinds.. *Herdmanella* Darboux.

ff. Median antenna inserted ventrally. Notopodial setae of two kinds, all finer than the neuropodials.. *Gastroceratella* Darboux.

dd. Dorsum normally left in part uncovered by the elytra.

Median antenna inserted at the margin; notopodial setae coarser than the ventrals.

e. Notopodial setae with transverse series of spinules............... *Lagisca* Malmgren.

ee. Notopodial setae simply serrate or wholly smooth.

f. Notopodials smooth; tip of ventrals simple.................... *Hermadion* Kinberg.

ff. Notopodials serrate; tip of ventrals bifid...................... *Scalisetosus* McIntosh.

Synonymy of Genera.

Nychia Malmgren being preoccupied is replaced by Gattyana McIntosh. Evarne Malmgren is also preoccupied (Adams, Moll., 1858) and is here replaced by Evarnella, nom. nov. Bylgia Théel is preoccupied (Münst., Crust.) and is replaced by Bylgides, nom. nov. Langerhansia McIntosh is preoccupied by Langerhansia Czerniawsky, a syllid genus. Eupolynoe seems first to have been used by McIntosh without diagnosis or discussion. He at that time placed under it (Ann. mag. nat. hist., 1874, ser. 4, **13**, p. 264) two new species, *occidentalis* and *anticostiensis*. The first seems to conform to Eucranta Malmgren and is quite likely *E. villosa* Malmgren, type of the genus; *anticostiensis* is apparently a Harmothoe. Accordingly Eupolynoe is suppressed. Hololepidella Willey (Ceylon pearl oyster fisheries report 1905, pt. 4, p. 251) seems identical with Lepidametria Webster. Adyte St. Joseph is regarded as a synonym of Scalisetosus McIntosh. Parapolynoe Czerniawsky does not seem sufficiently different from Polynoe to make separation justifiable. Norepea Johnston (1865) falls as a synonym to Iphione Kinberg. It was established with *Polynoe peronea* Schmarda as the type, but that species is the same as *Iphione muricata* (Savigny).

Plotolepis, gen. nov.[1]

Body short and slender, with the somites comparatively few.

Eyes four, small, sessile, the anterior pair more widely separated and those on each side close together. Prostomium bearing anteriorly a median and two lateral tentacles.

Parapodia lacking notopodial lobe and notopodial setae. Neuropodia elongate, with setae numerous. Setae in two groups, a smaller ventral one of coarser hairs and a dorsal one of much more numerous finer hairs. Heads of setae scaled, tips entire. Notocirri of two types, most of them being conspicuously elongate, all in the anterior region and in the posterior region those of alternate pairs, the intermediate ones of normal character. In the type the elongate cirri are greatly inflated and apparently act as floats.

The elytra are borne on somites II, IV, V, VII, IX, XI, XIII, XV, XVII, XIX, and XXI. They are very small, with elytrophores large; not at all extending over dorsum, each reaching but little beyond its elytrophore. All but the most posterior ones inflated, vesicular.

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[1] *πλωτὸς*, floating, and *λεπὶς*, scale.

GENOTYPE.— *P. nans*, sp. nov.

This genus is characterized especially by the remarkable modification of a definite number of the notocirri into the elongate and more or less inflated organs above described and also by the vesicular character and greatly reduced size of the anterior elytra. These modifications clearly suggest adaptations to the pelagic habit which is relatively uncommon in the family. Moore's *Drieschia pellucida* (Proc. Acad. nat. sci. Phila., 1903, p. 794, pl. 50, f. 1–12), taken in the Atlantic off Woods Hole, is clearly also a member of this genus, presenting the same inequality in the notocirri, the vesicular elytra, and similar form and general proportions of the setae.

PLOTOLEPIS NANS, sp. nov.[1]

Plate 7, fig. 3, 4.

The body and its appendages in general are colorless or but slightly tinged with brown, apparently from preservation, and are transparent or translucent. The eyes are black and the setae are colorless and transparent.

The body is very short. It is widest in the anterior half where the diameter does not vary much; but from near the middle caudad it narrows uniformly and conspicuously. The type is but 6.4 mm. in length. The greatest width over all, that is from tip to tip of opposite setae, is 7 mm., thus exceeding the length; and the width across the body alone is but 1 mm. The total of somites in the type is only twenty-one. The number of pairs of elytra is eleven.

The prostomium is about three fourths as long as wide. On each side it is evenly convex or weakly angular at the middle. Anteriorly it presents an excision in which the cirratophore of the median tentacle fits. On each side of this the horn of the prostomium bears the lateral tentacle. It is convex above and has the usual median longitudinal furrow, which is narrow and weak mesally but widens anteriorly where it passes into the anterior incision and posteriorly where a narrow triangular tongue extends into it from the second somite. The four eyes are small as usual, with the anterior a little the larger. The anterior eyes are much more widely separated than the posterior, and are situated on the sides of the head, the posteriors being more dorsal and each facing ectocaudad. The two eyes on each side are separated by less than their diameter. The ceratophore of the median tentacle is longer and much thicker than those of the laterals and narrows moderately distad; the style is long and slenderly uniformly tapered, reaching to the sixth somite. The ceratophore of each lateral tentacle is contiguous proximally with that of the median, narrows distad so as to have the form of the frustum of a cone, and projects cephalo-ectad; the style is clearly less than half as long as the median and reaches only to the second somite. The palpi are long and cylindrical, narrowing gradually toward the end and then more abruptly into a much more slender tip. They greatly exceed the lateral tentacles in length. (Plate 7, fig. 3).

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[1] nans, a swimmer.

The tentacular cirri, that is, the cirri of the peristomial parapodia, are attached at a level a little caudad of the middle of the prostomium. The dorsals and ventrals are equal in length, which much exceeds that of the median tentacle, reaching to the eighth or ninth somite.

The metastomial somites are strongly convex above, more flattened ventrally. The first above is produced forward at the middle into a triangular tongue extending over the caudal border of the prostomium and fitting in the middorsal furrow of the latter. These somites increase in length to the fifth or sixth in which the length is equal to that of the prostomium and the width about two and a third times the length. In the seventh or eighth somite from the caudal end the width is scarcely or not at all more than one and a half times the length, which remains actually about as in the somites of the middle region. There are no sharply defined intersegmental furrows. The anal cirri are missing.

The parapodia are long and relatively slender, excepting those of peristomium and first metastomial somite much exceeding the width of the somites to which attached. Each parapodium is widest a little distad of the base from where in outline as viewed from above it is at first of uniform width and then from near the middle narrows to the distal end at which it is compressed to an edge. Just proximad of the distal end it is raised into a thin ridge or plate both above and below so that the outline as viewed from in front or behind increases in height distad of the middle, again descending to the somewhat pointed distal end. At the distal end it is produced into a subtriangular, distally somewhat rounded, presetal process or lip. There is no distinct postsetal lip. There is no distinctly indicated notopodial lobe and there are no notopodial setae. The notocirri are attached at the extreme bases of the parapodia above. Their cirrophores are typically remarkably inflated above the pedicel-like bases into subcylindrical bladder-like cushions or vesicles which in the middle region of the body greatly exceed the adjacent elytrophores in size; the cirrophores of the first pair of notocirri are smaller than those of the immediately succeeding pairs, while those of the caudal region are in part more markedly reduced, with correspondingly shortened styles, the most posterior ones being smaller than the adjacent elytrophores. The styles of the longer type of notocirri are for the most part remarkably long, those of the first pair, *e.g.*, when laid back caudad, reaching to the twelfth somite, being decidedly stouter and much longer than the tentacular cirri and in the type having an actual length of 3.5 mm. The styles of the second and third pairs of notocirri are missing in all the types, but the cirrophores of these pairs are decidedly larger than those of the first pair, those of the third being largest of all, and the size of the basal scars would indicate that the styles were of proportionate length. The cirrophores of the fourth pair are again reduced but are larger than those of the first pair; in one paratype in which the style on one side is still present, the latter is seen to exceed in actual length that of the first pair, and when laid back, to extend over the eight succeeding somites, reaching thus from its own somite (the tenth) to the nineteenth. The fifth pair of notocirri are abruptly very different from the preceding ones, having an ordinary non-inflated cirrophore smaller than adjacent elytrophores and bearing a style of ordinary form and size, this extending only to or scarcely beyond the middle of the parapodium. The next notocirri, the sixth, are again of the inflated type, with styles a little shorter than those of the fourth pair, the seventh are again of the reduced type, the eighth again long, and so on. Thus there are the very elongate special notocirri on somites III, VI, VIII, X, XIV, and XVIII (in the type that of the eighteenth is relatively short though long in the paratype); short ordinary notocirri on somites XII, XVI, and probably XX. The neurocirri of the first metastomial pair of parapodia are attached at the extreme base of the latter; they are long and tapered, extending distad beyond the tips of the setae of the parapodium. All succeeding neurocirri attached a little proximad of the middle of parapodium, and short, failing much of attaining the end of the parapodium, in those of the middle region by as much as or more than their own length.

Elytra are borne on somites II, IV, V, VII, IX, XI, XIII, XV, XVII, XIX, and apparently also in a much reduced condition on XXI. The elytrophores in general are stout and cylindrical and extend dorsoectad from the bases of the parapodium. Most elytra are missing, but a few remain in one paratype. These are all small, having in general a maximum diameter only about twice that of the elytrophore. In outline each is broadly ear-shaped or suborbicular with an indentation on the exterior side and toward the anterior end. They are inflated and vesicular, upper and lower surfaces being decidedly convex, and are essentially smooth. The elytra of the nineteenth somite are smaller, each capping the long elytrophore and extending but little beyond it on each side; it is more nearly orbicular, lacking the indentation on the outer side.

The neuropodial setae are arranged in a vertical plane in which they spread out in a fan-like manner. They are of two distinct types in a dorsal and ventral group respectively. The ventral group consists in most cases of two setae but often of three and sometimes of up to four or five in the middle region of the body, which are shorter and stouter than the others with the heads short and not finely extended at the tip. The setae of the dorsal group are much longer and more slender throughout and much more numerous, the number being ordinarily from twelve to eighteen in parapodia of the middle region of the body, becoming fewer in the anterior region. In the ventral type the head is in outline somewhat like that of the head of a spear with one side slightly concave, the other slightly convex, with the tip bent a little toward one side; seriate finely pectinate scales occur along the concave side from base to tip of the head in two partly interlocking series; there is no subapical tooth. (Plate 7, fig. 4). In the setae of the dorsal group the heads are more slender and much more elongate, being drawn out distally above the series of scales into a long, very fine, smooth tip which is commonly more or less curved. In the first metastomial parapodia of the type only setae of the first, stout type are present, there being five of these in each; in a paratype a seta of somewhat intermediate form appears. No setae were detected on the peristomial parapodium.

Locality. Easter Island: 29 miles northeast of North Cape. Sta. 4694, (lat. 26° 34′ S., long. 108° 57′ 30″ W.). Surface. 22 December, 1904. Four specimens.

It is possible that the type-specimens of this species are not wholly grown; but they are so strongly characterized that there is no likelihood of difficulty of recognition. The most salient features of the form are those manifestly adaptive to its pelagic life, such as the long parapodia and setae, the inflated though small elytra, and particularly the greatly elongate, apparently pneumatic notocirri. As judged by the much inflated and large cirrophores, the style of the notocirri on the sixth somite, missing in the types, must have been of most exceptional length.

PODARMUS, gen. nov.[1]

Body short, tapering caudad, composed of comparatively few somites. Colorless and transparent.

Prostomium wider than long, divided by a median furrow. Bearing three tentacles all of which are inserted marginally. Ceratophore distinct, the style smooth and tapering. Palpi long and slender, gradually acuminate.

Parapodia uniramous, long (typically exceeding in length the width of the somite), at the distal end compressed anterocaudally and divided by a vertical fissure into a presetal lip and a shorter postsetal lip. Notocirrus attached toward base of parapodium above, long. Neurocirri attached distad of middle, short and subulate. A conspicuous cylindrical process extends from the caudal face near the same level as the neurocirrus than which it is much stouter but shorter.

Only neuropodial setae present, these consisting of stouter ventral ones and but little more elongate though much more slender dorsal ones, the head in these being very much more drawn out. The two forms equal in number or nearly so. Tips entire. No special natatory setae.

Character of elytra not known. Elytrophores in type fourteen pairs, occurring on somites II, IV, V, VII and alternate somites to XXIII inclusive and then on XXVI and XXIX.

GENOTYPE.—*P. ploa*, sp. nov.

Apparently this form is mostly closely related to Drieschia Michaelsen, but it differs in possessing the characteristic posterior process on the parapodia and conspicuously in the form and proportions of the setae. In the present form the two types of setae are obviously a modification of the same primary type, and the coarser ventrals are nearly as long as the dorsals and are numerous, being essentially equal in number to the dorsals with which they are not intermingled. In *Drieschia pelagica* Michaelsen, type of that genus, as indicated by Michaelsen's description and figures, the stout setae are proportionately to the dorsals very much shorter, more or less strongly curving sigmoidally, and very much fewer than the fine dorsals, which in turn proportionately to the parapodia are very much longer.

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[1] *πούς*, foot, and *ἀρμὸς*, a peg, in reference to the cylindrical process borne on the posterior side of the parapodium.

PODARMUS PLOA, sp. nov.[1]

Plate 6, fig. 6; Plate 7, fig. f. 1, 2.

Color indeterminable from types because of their darkening in the fixing fluid. Probably colorless and transparent like most other pelagic species of annelids.

Body comparatively short. Widest toward anterior end, the anterior end narrowing a little and the body narrowing very gradually and continuously caudad. Length of type nearly 9 mm.; width over all, that is to end of setae, about 4.2 mm. Total number of segments thirty. Number of pairs of elytrophores fourteen.

The prostomium is wider than long. It bulges out on each side but the outline laterally is rather evenly convex, not at all angular. The prostomium is divided symmetrically as usual by a deep median longitudinal furrow. Each half is subquadrate, not at all somewhat diamond-shaped as in Harmopsides. The ceratophores of the tentacles are cylindrical and extend directly forward. That of the median tentacle is stouter and longer in a paratype, but differing slightly in the type. The styles of the tentacles are broken off excepting one lateral one in a paratype. This is slender and terete, distally narrowing gradually to an acute point, not abruptly reduced to a filament. It is considerably shorter than the palpus. The palpi are slender and gradually acuminate, not abruptly reduced distally.

The parapodia of the peristomium occupy the usual position. The distal ends of the ceratophores are nearly on a level with the anterior end of the prostomium. The dorsal cirrus is gradually attenuate throughout its length. It exceeds the palpus in length. Ventral cirri missing.

Dorsal surface of metastomial segments convex, the ventral more flattened as usual. Neural ridge evident, rather narrow, set off by shallow furrows. No anal cirri.

Parapodia in the types as preserved relatively long, exceeding in length the width of the segments to which attached. Subconically enlarged at base in the usual way; distad of elytrophores and dorsal cirri slender and nearly cylindrical, but a little less in diameter at middle than more distad. The end region of each parapodium is flattened in the anteroposterior direction and in dorsal view appears narrowed distad; the end is divided by a subvertical fissure sepa-

[1] πλωὰς, floating.

rating a presetal lip from a little less shorter postsetal lip. Between the apical lips the setae are inserted in vertical series and spread out in a conspicuously fan-like form. The notopodial lobe is represented by a low, rounded elevation and bears no setae. Each dorsal cirrus is attached toward the base as usual; the cirrophore is swollen, narrowed distad; the style is proximally rather stout, evenly attenuated distad and reaching to near the tips of the longest setae and in life probably exceeding them. The ventral cirrus attached distad of the middle of parapodium; short and subulate, not fully reaching end of neuropodium.

Elytra all missing. Elytrophores cylindrical, of moderate length, fourteen pairs inserted on the following somites: II, IV, V, VII and alternate segments to the twenty third and then on XXVI and XXIX.

The neuropodial setae are arranged in a vertical plane in which they spread out more or less in fan-like manner. They are of two distinct types: a ventral group of which the members are shorter and stouter, both proportionately and actually, with the heads shorter and less slender at tip; and a dorsal group of longer and more slender setae in which the heads are elongate and apically slenderly drawn out. In setae of the ventral group the head is spear-shaped in outline with the sides above the fusiform basal thickening first concave and then nearly straight, till at the tip one side is convex and the other concave, the acute tip bending over toward one side; on this side from base of head to tip are two series of a few well-separated scales; no subapical tooth. (Plate 7, fig. 1, 2). In the dorsal group the heads of the setae are much more narrow and elongate, with above the series of scales a very long and slender essentially smooth tip which is flexible and appears ordinarily more or less curved dorsad. (Plate 6, fig. 6). The two kinds of setae are typically about equal in number, there being fifteen of each, or a total of thirty in the parapodium of the type. The setae of the first metastomial parapodia are shorter, with the heads less elongate, the setae of the ventral type predominating. The acicula are small and neither protrudes from the surface.

Locality. Off North Cape: Easter Island. Sta. 4694 (lat. 26° 34′ S., long. 108° 57′ 30″ W.). Surface. 22 December, 1904. Three specimens. The specimens were fixed in Fleming's fluid. They are of varying sizes, and probably even the largest is not fully grown.

This form has a similar general appearance to *Harmopsides nans*, a similarly pelagic form. Both have similar comparatively short bodies with the number of elytra correspondingly reduced. The present species in life was doubtless transparent. The fixing of the types in Fleming's fluid, however, blackened the tissues.

HARMOPSIDES, gen. nov.[1]

Body short, composed of comparatively few somites, colorless and transparent.

Prostomium wider than long, divided into two equal halves by a deep median furrow, each half in outline somewhat diamond-shaped. Tentacles three, inserted marginally. Ceratophores distinct and the styles smooth and subulate. Palpi comparatively long and slender, pointed.

Parapodia long, with the notopodium represented only by a slight non-setigerous tubercle into which the tip of an aciculum extends. At the end of the neuropodium a digitiform presetal process into which the aciculum penetrates. Notocirri long. Neurocirri attached well distad of the middle of the parapodium, all small excepting the first which is attached near the base of the parapodium and in length is comparable to a tentacular cirrus.

Setae of two forms, both a modification of the same fundamental type, the first consisting of stouter ventrals with short heads and the second of much more numerous and greatly elongate finer ones of the dorsal portion of fascicle in which the heads are slenderly elongate. Apices of all setae bifid or with a subapical tooth.

Elytra not known. Eighteen pairs of elytrophores in the type-species, these occurring on somites II, IV, V, VII, IX, and then on alternate ones to the XXIII and thereafter on XXVI, XXIX, XXXII, XXXIV, XXXVII, and XL.

Armature of the proboscis as usual in the family.

GENOTYPE.—*H. natans*, sp. nov.

This genus is near Nectochaeta Marenzeller, erected for *grimaldi* Marenzeller, taken in the Atlantic. It is regarded as distinct especially because of the presence of the prominent subtentacular process, the absence of all notopodial setae, and the larger number of somites, the elytra numbering eighteen pairs as against only eleven in Nectochaeta.

HARMOPSIDES NATANS, sp. nov.

Plate 6, fig. 1–5.

The body of the type as preserved having a very dilute yellow tinge but probably colorless in life, as are the paratypes at present, transparent.

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[1] *ἁρμὸς*, a peg, and *ὤψ*, face, in reference to the subtentacular process.

Body short. It is widest near the sixth somite from where it tapers continuously to the caudal end. The greatest width inclusive of the parapodia is attained a little farther caudad, since the anterior parapodia are shorter than the succeeding ones, those toward the caudal end also decreasing in length. Dorsum convex, the venter less so and with a distinct neural ridge set off on each side by a sharply impressed narrow furrow or sulcus. Length, 17 mm.; greatest width, exclusive of parapodia, 2 mm.; width to tips of parapodia, 5.2 mm.; and to tips of setae nearly, 9.5 mm. Number of somites forty-four; number of pairs of elytra, eighteen.

The prostomium is wider than long. On each side it protrudes strongly and angularly, the apex of the angle being at the middle of the length. It is separated into two equal halves by a deep median longitudinal furrow. Each half or lobe is prolonged directly forward into a terete and slightly clavate ceratophore which is somewhat constricted at the proximal end. Each eye of the anterior pair is located on the protruding lateral angle of the corresponding lobe. The eyes of the posterior pair are smaller in size, much closer together, and dorsal in position. Each is separated by about twice its diameter from the corresponding anterior one. The ceratophore of the median tentacle is inserted anteriorly between the two halves of the prostomium. It is cylindrical, somewhat narrowed distad, and equal in length to the lateral ones. Proximally the style is of the same thickness as the ceratophore but tapers continuously and uniformly for about two thirds of its length and then more rapidly into a slender, filiform, and acutely pointed tip. Its total length, inclusive of ceratophore, is about four times the length of the prostomium proper. The styles of the lateral tentacles are of the same form as that of the median but are more slender and shorter. The palpi are comparatively slender. Each narrows from its base continuously to a slender acute tip, and in length is equal to the median tentacle or nearly so. (Plate 6, fig. 1).

The peristomium shows distinctly above as a transverse band which is small, with its anterior margin convex. The parapodia extend obliquely forwards, the distal ends of their cirrophores attaining the level of the anterior margin of the prostomium. Each bears a stout spine or aciculum and three small, curved, somewhat sickle-shaped, setae. Each cirrus tapers gradually to a slender tip, the upper one extending distad the same distance as the palpi while the inferior one is shorter.

The parapodia are relatively long and, except in the anterior region, equal or surpass the width of the somite to which attached. Proximad of the elytrophores and dorsal cirrophores the parapodia are thicker anteroposteriorly and deeper, the dorsal line rising dorsomesad while the ventral one remains horizontal; distad of this they continue to narrow to the slight notopodial eminence, beyond which the neuropodium is very slender and more uniform in thickness. The neuropodium at the distal end is produced into a slender digitiform process through one side of the base of which the aciculum protrudes. The notopodium is a slight tubercle on the dorsal surface into which an aciculum extends but which bears no setae. The ventral cirrus is attached distad of the middle of the parapodium and is a small, slenderly subulate filament not attaining the end of the neuropodium. The dorsal cirri are found on the parapodia of the somites between those bearing elytra. In each of these beyond the swollen basal joint, or cirrophore the style continues as a gradually and slenderly acuminate filament which reaches to or extends a little beyond the distal ends of the longest setae.

The acicula are distally a little denser or less clearly transparent than proximally. The notopodial one is shorter and more slender than the neuropodial. Only neuropodial setae are present. These are of two types. On the ventral side of the setigerous surface of the neuropodium is a group of stout setae of ordinary length each of which ends in an asymmetrical, lanceolate head. (Plate 6, fig. 5). A little below the apex of the head is a small subapical tooth and proximad of this, over the entire length of the more oblique side, is a close series of ovate, lanceolate scales. Above this ventral group are setae of a second type which are three or more times as numerous. These are of smaller actual diameter and at the same time much longer, the longest being from two to three times the length of the ventrals. They are comparable in structure to ventral ones imagined as greatly stretched, giving an exceedingly long and slender and usually gently curved head along the convex side of which the scales are correspondingly more widely separated. (Plate 6, fig. 3, 4). In each there is a small subapical tooth which seems to be easily lost. Some setae show the scales along two sides, but the scales on one of the sides form only a short series.

The elytra are all missing. Eighteen pairs of elytrophores are distinguishable in the type. The elytrophores are subcylindrical and of moderate length, decreasing in diameter and length caudad. The bases of the parapodia between those bearing the elytrophores are somewhat more crassate than the others. The elytrophores occur on somites II, IV, V, VII, IX, and on alternate succeeding somites to XXIII, and then on XXVI, XXIX, XXXII, XXXIV, XXXVII, and XL.

The two anal papillae are short, somewhat swollen at base, and slender distally.

In a paratype from Sta. 4675, near 10 mm. long, the extended proboscis is 1.8 mm. long with its greatest diameter scarcely less. Along the distal edge there are nine ventral papillae and nine dorsal ones, these flattened and lanceolate or ovate-lanceolate in outline. (Plate **6**, fig. 2).

LOCALITIES. Off the coast of Peru. Sta. 4668 (lat. 12° 9′ S., long. 81° 45′ W.). Surface. 19 November, 1904. One specimen (type).

Off Peru. Sta. 4661 (lat. 10° 10′ S., long. 82° 02′ W.). 300 fms. to surface. 15 November, 1904. Four specimens.

Off Palominos Light House: Peru. Sta. 4675 (lat. 12° 54′ S., long. 78° 33′ W.). 300 fms. to surface. 22 November, 1904. Two specimens.

Off southwest coast of Central America. Sta. 4613 (lat. 9° 43′ N., long. 86° 15′ W.). Surface. Surface temp., 82–79° F. 19 October, 1904. Two specimens.

Off Peru. Sta. 4663 (lat. 11° 20′ S., long, 88° 55′ W.). Surface. Surface temp., 69° F. 15 November, 1904. Two specimens.

Off Peru. Sta. 4664 (11° 30′ S., long, 87° 19′ W.). Surface. Surface temp., 68° F. 17 November, 1904. One specimen.

Off Peru. Sta. 4669 (lat. 12° 13′ S., long. 80° 24′ W.). Surface. Surface temp., 67° F. 19 November, 1904. Six specimens.

Between Peru and Easter Island. Sta. 4676 (lat. 14° 29′ S., long. 81° 24′ W.). Surface. 5 December, 1904. Two specimens.

HARMOTHOE Kinberg.

Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 386; McINTOSH, British annelids, 1900, **1**, pt. 2, p. 313; DARBOUX, Bull. sci. France & Belgique, 1900, **30**, p. 106 (in part).
Eumolphe OKEN, Lehrb. naturgesch., 1815, **1**, p. 375 (in part); BLAINVILLE, Dict. sci. nat., 1828, **57**, p. 457.
Eupolynoe McINTOSH, Ann. mag. nat. hist., 1874, ser. 4, **10**, p. 13 (in part).

HARMOTHOE HIRSUTA Johnson.

Plate **2**, fig. 2–8; Plate **3**, fig. 1.

Proc. Cal. acad. sci. Zool., 1897, ser. 3, **1**, p. 182; EHLERS, Zool. jahrb. Suppl., 1901, **2**, p. 253; Abhandl. K. gesellsch. wiss. Göttingen. Math. phys. klasse, 1901, p. 42.

Two apparently immature specimens from islands off Panama are referred to this species which occurs from the California coast at San Pedro southward to the Chilean coast. In general structure they agree with adults of *hirsuta* from San Pedro excepting that the notopodial setae are comparatively more slender, being mostly clearly more slender than the neuropodials and more numerous than is typical, and that the anterior eyes are rather more dorsal in position and thus clearly visible in dorsal view. Above they show the characteristic nuchal process from the anterior edge of the first metastomial somite which, as pointed out by Ehlers, serves as an easy distinguishing mark in comparison with the closely related *Harmothoe polytricha* (Schmarda) which occurs on the other side of the isthmus in the Caribbean region. The parapodia of the peristomial somite bear three (or sometimes two) conspicuous setae. The small specimens from Panama are described in full below.

The body is short. It is widest near the junction of the first and second fourths of the length but narrows only weakly from there caudad to the beginning of the last fourth over which it narrows more strongly to the pointed anal end; anteriorly also narrows strongly to the prostomium. The dorsum is only slightly arched. Venter also slightly arched, and presenting a sharply limited, caudally tapering, ridge. Total length of one specimen near 11 mm.; greatest width, exclusive of parapodia, 2 mm.; width to ends of parapodia, 3.5 mm.; width to ends of setae, 5.6 mm. Number of somites thirty-seven.

Prostomium decidedly wider than long, sloping strongly from behind forwards. A wide median longitudinal furrow dividing it into two symmetrical halves. Each half rises to a longitudinal ridge extending forwards to the apex of the peak, the prostomium otherwise smoothly rounded. On each side it bulges convexly into an optical lobe. Each anterior eye situated rather laterally on the lobe and distinctly visible from above. The posterior eyes are much closer together and are dorsal in position; they are more than three fourths the diameter of the anterior ones, from which they are separated by three times their diameter or nearly so. The peaks are conspicuous; each is a stout subconical process extending over the base of the corresponding lateral tentacle, its abruptly narrower tip separated by a wide space from the median ceratophore, though this space is less than the half-diameter of the ceratophore at its base. The peaks in one specimen are darkened. The ceratophore of the median tentacle is stout and much narrowed distad; it is blackish in color, contrasting strongly with the prostomium; the style is missing. The lateral tentacles arise from beneath the base of the median ceratophore. Each lateral ceratophore is cylindrical, shorter and much less thick than the median. In one specimen the style is nearly twice the length of the prostomium and in the other specimens is considerably shorter than this; it is dusky in color; it is terete, a little narrowing to near the middle of the length and then more quickly narrowing into the slender terminal filament. The palpi in length surpass the lateral tentacles. They are stout proximally, narrow strongly distad and toward the end are more abruptly reduced and end in a paler, slenderly conical tip. Dusky in color. (Plate 2, fig. 2).

The parapodia of the peristomium lie close at the side of and partly beneath the prostomium. Each bears three curved setae of the notopodial type.

The metastomial somites are all distinctly separated. Excepting toward the end of the body they are of nearly uniform length which is medium. The first three somites on the ventral side are bent caudad at the middle into a short subrectangular flap or tongue-like process. Nephridial papillae low, rounded.

Parapodia prominent but shorter than the width of the somites. A typical parapodium at the proximal end is very deep but is compressed anterocaudally. The neuropodium is a short subcylindrical process extending obliquely dorsoectad from near the middle of the dorsal surface of the parapodium; distally it is truncate, the distal surface bearing the numerous setae, and the ventral edge is extended into a slender, subulate acicular process. The neurocirrus is attached on the ventral surface proximad of the middle; the cirrophore is short and narrows distad to the base of the style which at its beginning is of the same width; the style is short and subulate, reaching the bases of the nearest neuropodial setae but fails much of reaching the end of the neuropodium; the cirrophore is dark but the style pale. The notocirri are stout and subconical, usually darkened or dusky; they are densely clothed with long cilia mostly exceeding in length the diameter of the style. (Plate 2, fig. 3).

The acicula are pale, extending into the acicular processes but not projecting beyond the neuropodial, and but little beyond the notopodial, process. Neuropodial aciculum much stouter than the notopodial. Neuropodial setae much exceeding the notopodials in length; arranged in vertical series spreading in fan-like manner; about forty in number in the parapodia of the median region. Each consists of a slender shaft and a spear-like head, the seta gently curved from a little below the head to the tip. Head bidentate, the principal tooth a little curved, the subapical tooth small, straight, and acute, parallel, or nearly so, to the axis of the principal tooth; convex side of the head densely pectinate from the base nearly to the lower tooth. The most ventral neuropodials are shorter than the others, with the heads much reduced in length. (Plate 2, fig. 7, 8). The notopodial setae are very numerous and are densely arranged in whorls;

the outer setae on the proximal side are much shorter than those in the inner part of the fascicle and on the distal side. Each notopodial is slender and gently curved; the smooth apex is short and acute with no trace of a subapical tooth; the conspicuous pectinae extend from the tip over nearly the whole length of the exposed portion of the seta, the smooth proximal portion of the shaft being short. (Plate **2**, fig. 4–6; Plate **3**, fig. 1).

The elytra are all missing in the specimens studied. The elytrophores have the usual arrangement, occurring on somites 2, 4, 5, 7, etc. They are short and proportionately thick and present the usual subelliptic to ear-shaped scars.

The body is greyish, in part of a dusky tinge; a darker area on each somite at each lateral end on the ventral surface and a dark ring about the proximal end of each neurocirrus. The notopodial setae are orange in appearance. The neuropodials are paler, dilute yellow.

LOCALITY. Panama: Perico Island. Shore. 26 October, 1904. One specimen. Panama: Taboguilla Island. Shore. 30 October, 1904. One specimen.

HARMOTHOE MEXICANA, sp. nov.

Plate **1**, fig. 1–9; Plate **2**, fig. 1.

The body is well pigmented, being in general a rather dark brown with the parapodia a shade lighter. There is typically a paler narrow median longitudinal stripe along the venter. The palpi and the other appendages of prostomium and peristomium are yellowish to whitish as are also the cirri. Segmental papillae whitish. Setae yellowish.

The body narrows strongly cephalad from the fifth or sixth somite, the anterior end appearing convexly rounded laterally as well as anteriorly. From the fifth or sixth somite, the region of greatest width, the body proper narrows continuously caudad and at the caudal end is very narrow; however, the parapodia, with their setae, increase in length from the anterior end toward the middle, so that the decrease in width of the body proper is offset for a considerable distance. In the region of the greatest width the depth is about the same as the width exclusive of the parapodia; the depth is less cephalad of this level and decreases caudad from it in such manner that the caudal region may appear conspicuously flattened. A specimen 39 mm. long has a maximum width to the bases of the parapodia of 3.8 mm.; widths to tips of parapodia, 6 mm.; and to tips of the setae, 8.2 mm.

The prostomium in front presents two very large, conical peaks which project forwards, one on each side of the median ceratophore. These peaks vary considerably in the amount of their projection. There is a black area at the base and caudad of each. Caudally the prostomium is rounded, expanding from the caudal end to the middle and thus convexly bulging on each side. There is a well-marked median longitudinal furrow from the base of the median ceratophore caudad, and also a transverse furrow, caudad of which the prostomium is typically more elevated. Two pairs of eyes of which the caudal ones are dorsal and are much closer together than the anterior ones, which are low on the sides or subventral and not typically evident in dorsal view. Each lateral tentacle projects from beneath the peak of the corresponding side. Each lateral ceratophore is attached beneath the base of the peak and projects ventrad and is short and cylidric. The lateral tentacles are about as long as the prostomium inclusive of its peaks. Each tapers uniformly from its base to the very slender and acutely pointed tip. The ceratophore of the median tentacle is a stout cylindrical body which narrows more or less distad; its distal end is nearly on a level with that of the peaks. The palpi are about twice the length of the prostomium. Each is terete and narrows uniformly distad to an acute tip. There is no distinct terminal filament. (Plate 1, fig. 1).

The parapodia of the peristomium have the usual position. The ceratophores attain or a little surpass the level of the most caudal point of the median tentacular ceratophore but fall much short of attaining the level of the apices of the prostomial peaks. The tentacular cirri taper evenly from base to the slender tip and considerably exceed the palpi in length. Each parapodium bears two, or sometimes three, stout setae resembling the notopodial setae of the succeeding somites, each thickest proximally and narrowing distad to the acute apex. (Plate 1, fig. 1).

The metastomial somites are moderately arched above and below, the ventral convexity sometimes appearing considerably more arched than the dorsal. Ventrally there is a wide median furrow, most of which is occupied by the neural ridge. Pygidium a small and almost tubercle-like projection. Anus terminal. Nephridial papillae begin on the sixth somite as usual. They are minute, short, subcylindric processes of whitish color projecting from a small tubercle at the base of the parapodium. Each extends straight ectocaudodorsad, or the somewhat longer ones of the middle region curving more dorsad distally.

The parapodia are short, being considerably shorter than the width of the somite to which they are attached, excepting in the narrower caudal region. They appear flattened in the cephalocaudal direction. Depth proximally great and equalling or exceeding the length exclusive of the setae. Narrowing moderately distad, the dorsal edge being nearly horizontal and the ventral oblique. The two rami are distinct and well separated, the neuropodium a little exceeding the notopodium. Each branch is conically narrowed and drawn out distally into a slender acicular process. The neurocirri are very small, short and subulate. Each is attached at the middle of the ventral surface and reaches to the distal end of the neuropodium proper or a little beyond it, but not to the end of the acicular process excepting in the second parapodia. The neurocirri of the second somite are much longer, extending beyond the ends of the setae. The notocirri are slender and filiform, distally subulate. They extend out well beyond the tips of the setae. Their cirrophores are attached close to the bases of the notopodia and are large and conical. (Plate 1, fig. 2).

In each branch of the parapodium there is a single aciculum which is pale yellow in color and is plainly transversely striate. The tip of the neuropodial aciculum projects freely at the side of the tip of the acicular process, which exceeds the aciculum. The notopodial aciculum extends through the acicular process and exceeds the neuropodial. The notopodial setae are in a spreading whorl, diverging distad and bending mesad conspicuously over the dorsum, especially in the caudal region, much as in *yokahamiensis*. They are pale yellow in color. Each is typically a blade-like structure widest at its middle, narrowing moderately proximad and distally narrowing to an acute point. One side is more nearly straight than the other and is commonly a little concave or angularly inbent, the other edge being convex. One of the broad surfaces is commonly concave and the other convex, or the seta in cross-section at the widest part may be subtriangular. On the convex side there are numerous cross-series of spines or pectinae, the number being commonly about fifty; a rather long distal region or tip is free from pectinae. At the widest part the full-sized notopodial setae have twice, or slightly more, the maximum diameter of the ventrals. The most dorsal are longest and have a length (free portion) as great as the length of the corresponding neuropodials or nearly so. (Plate 1, fig. 9). The neuropodial setae are long and fine, and present a long smooth shaft, a pectinate distal division, and a smooth, acute, bifurcate tip as usual. They are not of the same structure throughout the fascia, in each of which there may be from thirty-six to forty or more setae. The more dorsal and more numerous setae are widest at the proximal end of the pectinate division from where they narrow distad to the slender acute tip; each bears ordinarily thirty-five to forty pectinae; the smooth tip ends in a slender principal tooth or prong which is nearly straight along its mesal edge and convex on the ectal; the accessory subapical tooth is very short, straight and divergent, and varies considerably in proportionate length and stoutness. In a second type of neuropodial the general form is similar to the preceding but the pectinae are much lower, more like those of the notopodials. The setae of the most ventral series are conspicuously different. The yare much shorter and more slender and each distally, beginning at the proximal end of the pectinate division, is strongly curved. Each ends in a slenderly acute and entire tip. (Plate 1, fig. 5–8; Plate 2, fig. 1). The peristomial setae are of the general type of the notopodials.

The elytra are of the usual number and arrangement. They are moderate in size. In outline they are subrotund, but with the anterior and ectal edges more or less flattened and nearly straight, so that the outline sometimes appears subtriangular with the hypotenuse more convex. Each is densely studded with conical, corneous, and colorless papillae each of which rises from a more expanded, darker, disc-like base. These project from the caudal and ectal edges. No soft papillae proper were detected. Cilia occur sparsely over the entire surface, these projecting sparsely between the papillae of the general surface as well as between the marginal ones of the caudal and ectal edges. The cilia are slenderly cylindrical or distally slightly narrowed, transparent, and of moderate length. The elytrophores are of moderate size. Each presents the usual ear-shaped scar. In position corresponding to that of the elytrophores, there is on each non-elytrophorous somite on each side a conspicuous, stout, conical and light colored process.

LOCALITIES. Off Mexico. Sta. 3425 (lat. 21° 19′ N., long., 106° 24′ W.). Depth, 680 fms. Bottom of green mud and sand. Bottom temp., 39° F. 18 April, 1891. Several specimens.

Off Mexico. Sta. 3430 (lat. 23° 10′ N., long., 107° 31′ W.). Depth, 852 fms. Bottom of black sand. Bottom temp., 37.9° F. 19 April, 1891. One specimen.

In lacking large soft papillae on the elytra this species agrees with *H. yokahamiensis* McIntosh, now known from near Santa Catalina and adjoining islands and from Monterey Bay off the California Coast as well as from Japan, the type-locality. From that species it differs clearly in having the peaks of the prostomium very prominent, in the greater relative length of the notopodial setae and in the form of the neuropodial setae, especially of the most ventral ones which are reduced and have a characteristic curve or geniculation distally, a detail in which it seems to differ from other species of this group as well.

Eunoe Malmgren.

Öfvers. K. vet. akad. Förh., 1865, p. 56, 61.
Eunoa Malmgren, Annulata Polychaeta, 1867, p. 6; McIntosh, British annelids, 1900, **1**, pt. 2, p. 291.

Eunoe eura, sp. nov.[1]

Pl. 3, fig. 2–6.

The dorsum along the middle is brownish, darker caudad; laterally the color is of a distinctly greenish tinge. The venter is also light brownish but with a greenish cast along a median longitudinal band. Parapodia and setae lighter, yellowish.

The body is broad; it narrows from a little in front of the middle cephalad; it is broader caudad of the middle than in front of it, narrowing but moderately over about the posterior fourth, the caudal end rounded. The greatest depth of the body is nearly equal to the greatest width exclusive of parapodia (about 8.2 mm.). The depth is uniform over the middle two fourths but decreases conspicuously cephalad and caudad respectively over the anterior and posterior fourths. Segments thirty-five in number. Length of type, 45 mm., maximum width, exclusive of parapodia (measured across ventral surface), 8.2 mm., to tips of parapodia, 15.5 mm., to tips of setae, 23 mm.

Prostomium widening anteriorly, subcordate but with apex or posterior end bluntly widely rounded; width (2 mm.) a little exceeding the length; the peaks very low and rounded, inconspicuous, each separated from base of median tentacle and more widely from the lateral. Median longitudinal furrow above on prostomium weak, disappearing caudad; on each side a furrow mesad of the rounded elevation, these furrows running caudad and then obliquely caudoectad, thus diverging from each other caudad. Eyes none. Ceratophore of median tentacle at widest level one third the greatest width of the prostomium, strongly narrowed distad, at first abruptly and then gradually; length near the total length of the prostomium; above, over basal portion, a longitudinal median furrow which extends also over part of prostomium, the furrow becoming less distinct caudad. Style missing except for extreme proximal end. Ceratophore of lateral tentacles less than half as long as that of the median, half its greatest width; lateral tentacles as wholes manifestly shorter than the prostomium; styles at proximal end as wide or wider than ceratophore, conically narrowed distad, the apical portion slender and acute; no distal enlargement whatever; sensory processes numerous, strictly cylindrical, transparent. Palps terete, slenderly conical, the tips very slender and acute, the total length about three and three fourths times as great as that of the prostomium; cilia arranged in longitudinal rows as usual, each small, cylindrical, or sometimes enlarged distally, transparent, arising from a slight tubercle. (Plate 3, fig. 2, 3).

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[1] εὐρὺς, broad.

Peristomial parapodia bearing two curved setae; the ceratophores prominent, reaching beyond anterior border of prostomium; styles missing in type. Peristomium not evident dorsally.

Metastomial somites conspicuously arched above over entire length of body but somewhat more depressed caudad; ventrally less strongly arched. Pygidium very small; no subanal cirri detected. Neural groove sharply defined, rather wide. Nephridial papillae beginning on the fifth somite, on which they are minute; at twelfth and thirteenth somite obviously increasing abruptly in size, which is uniform from there caudad; papillae bending dorsad into the intersegmental furrows.

The parapodia of the middle region of the body are very long, being three fifths as long as the width of the somites; stout, little compressed. The notopodium is much smaller than the neuropodium, appearing upon the anterodorsal surface of the latter as a small lobe near the middle of its length, the distal end of the notopodium falling far short of that of the neuropodium; in the form of a short, somewhat obliquely truncated and but little compressed cylinder which bears the numerous setae on its distal surface and at the caudal the usual finger-like process which is cylindrically or distally somewhat enlarged, which reaches to near the distal end of the neuropodium, and through which the aciculum extends. Neuropodium strongly compressed subdorsoventrally, thicker at base than distad, the distal edge rising from caudal end cephalad to an angular apex from which arises the finger-shaped process, this being of the same form and size as that of the notopodium, and much shorter than the setae; the aciculum extends into the process as usual.

Ventral cirri arise at middle of length of parapodia. Each, when laid against the parapodium, reaches the apex of the latter, the base of the finger-like process; the cirrophore is a conspicuously thickened tubercle; the filament is slenderly subulate and smooth. The dorsal cirrophores are large cylindrical processes which lie against the parapodium, being not at all erected; the styles of the dorsal cirri much surpassing the neuropodial setae but when laid back against the dorsum in the middle region falling much short of reaching its middle line; bearing numerous sensory processes which are cylindrical and transparent. (Plate 3, fig. 3).

In each branch of the parapodium there is a single yellow aciculum; this is stout and long, tapering distad to an acute point; in the notopodium this extends through and beyond the tip of the finger-shaped process, but it does not attain the end of this process in the neuropodium. The notopodial setae are rather numerous, being spread over the entire oblique surface of the process, projecting ectad, increasing in length from those at the inner end to those at the outer or distal; they are much shorter than the neuropodials and are mostly also clearly more slender; they agree in structure with the neuropodials excepting that the short, small, apical process is normally bluntly rounded, ending in a slight knob and the pectinate structures are more plate-like, and the pectinae less hair-like. (Plate 3, fig. 6). The neuropodials are numerous and long; each presents a long slender and smooth shaft, above which is a blade clearly, but not greatly wider at its proximal end than the shaft, from which it narrows continuously to an acute point; the blade is usually moderately curved; from the base nearly to the extreme apex it bears numerous obliquely transverse rows of hair-like processes; there may be fifty or more of these combs; the naked apex is very short, smooth, and acute. Tips without trace of incision or accessory process. (Plate 3, fig. 4, 5). The setae maintain the same structure throughout the body.

Elytrophores occur, as usual, on the second, fourth, fifth, seventh, and alternate succeeding ones to the twenty third, on the twenty sixth, twenty ninth and thirty second. They are rather prominent with a suboval scar of which the smaller end is mesad. Unfortunately all the elytra are missing.

Locality. Off Peru. Sta. 4,675 (lat. 12° 54′ S., long., 78° 33′ W.). Depth, 3,120 fms. 22 November, 1904. One specimen.

In lacking eyes this form is like *E. abyssorum* McIntosh, the type of which came similarly from a great depth (2,600 fms.) south of Australia. The latter is a smaller species readily distinguished from the one above described by the obvious differences in the setae. *Eunoe caeca* Moore is another blind species which was dredged in Monterey Bay at a depth of from 861 to 1,062 fms. This is a narrower species differing very conspicuously in the structure of its setae as well as in the form of the prostomium, the form and proportions of the parapodia, and various other features.

Lepidasthenia Malmgren.

Annulata Polychaeta, 1867, p. 15; Darboux, Bull. sci. France & Belgique, 1900, **30**, p. 109.
Eumolpe Blainville, Dict. sci. nat., 1828, **57**, p. 457 (in part).

The most salient character of this genus consists in the great reduction of the elytra, to which the name refers, through which the dorsum is in large measure left naked, and in the rudimentary notopodium. The notopodial setae, while usually wholly absent, may be present in much reduced size and numbers in some species (*L. irregularis* Ehlers, *L. argus* Hodgson). The characteristic bifid apex of the setae so obvious in most species is present only in the setae of the seventh somite in *L. microlepis* Potts.

Key to Species.

a. Neuropodial setae equal in size throughout each fascia.
  b. Some notopodial setae present at least on the anterior parapodia.......*L. irregularis* Ehlers.
  bb. No notopodial setae on any of the parapodia.
    c. Elytra covering parapodia...*L. minikoensis* Potts.
    cc. Elytra quite rudimentary, merely capping the elytrophores............*L. microlepis* Potts.
aa. Upper neuropodial setae conspicuously different in size from the lower ones.
  b. Upper neuropodial setae greatly enlarged.................................*L. elegans* Grube.
  bb. Upper neuropodial setae more slender than the others.
    c. A few notopodial setae present on at least some of the parapodia..........*L. argus* Hodgson.
    cc. No notopodial setae on any of the parapodia.
      d. Pairs of elytra above 25; littoral forms.
        e. A distinct notopodial process on at least the more anterior parapodia. .*L. curta*, sp. nov.
        ee. No trace of a notopodial process on any of the parapodia............*L. maculata* Potts.

Lepidasthenia curta, sp. nov.[1]

Plate 5, fig. 4–9.

The body is flattened above and more convex ventrally; below there is a neural furrow and within this a distinct neural ridge. Inclusive of parapodia, it is of uniform width over the middle region, being widest just caudad of middle, but it narrows considerably both at the anterior and posterior end; the body itself, with parapodia excluded, is widest anteriorly and narrowest caudad. The total length of the type exclusive, of the protruded proboscis, is about 27.5 mm.; greatest width, exclusive of the parapodia, 2.25 mm.; to tips of parapodia and exclusive of setae, 4.4 mm.; inclusive of setae, 6 mm. or a little more. The number of somites is fifty-six.

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[1] curtus, short.

The prostomium is covered above by the transparent first and second elytra. It is trapeziform or subhexagonal with the transverse diameter or width exceeding the length. It is widest a little behind the middle where it bulges on each side. Upon the bulging lobe on each side is borne a large eye. The posterior eyes are much smaller and closer together and each is close to, and in life may possibly be covered by, the base of the parapodium of the first metastomial segment. The ceratophore of the median tentacle is inserted in an incision in the middle of the anterior border; its base extends caudad in a narrowing, wedge-shaped process; it narrows subconically distad to the truncate end, on which is inserted the style; the style is long, though it is shorter than the palps, fully three times as long as the prostomium; it narrows continuously from the base to the slender and acute tip; without any evident subterminal enlargement; the ceratophores of the lateral tentacles are inserted farther forward; each is subcylindrical, but narrows distad like the median; the distal end of the ceratophore is much thicker than the base of the style; the style is shaped like that of the median tentacle but is shorter. The tentacles are pale without any evident darker markings in the type as at present. The palpi are a little longer than the median tentacle; each is terete and acuminate, and ends in a slender thread-like tip. (Plate 5, fig. 4).

The ceratophores of the parapodia of the peristomium extend forward about to the level of the anterior border of the head; the styles are of the form of the tentacular styles but are somewhat longer than the median of these.

The extended proboscis is 4.2 mm. long and 2.5 mm. thick.

The metastomial somites are distinct. They are of similar form and structure throughout. The pygidium is minute and subcylindric; anus terminal. The nephridial papillae are situated on the bases of the parapodia; each is borne at the caudal edge and is a slender, cylindrical tube of white color which bends dorsad in the intersegmental cleft.

The parapodia in the anterior region are only half, or but little more, the width of the body proper; but in the median and posterior regions they fully equal the width of the somites to which attached. From the base outward they are subcylindric or slightly narrowing distad, the distal end conically attenuated and rounded. At the distal end is a larger, distally rounded, postsetal process and a much more slender, cylindrical, presetal process, the setae emerging between these processes. The notopodium appears on the anterior parapodia as a short and slender cylindrical process into which an aciculum extends; this becomes lower caudad and in most segments is not evident as such. The dorsal cirrus is attached caudad of the middle of the parapodium and extends distad to or a little beyond the tips of the neuropodial setae; it is terete and acuminate to a fine tip like the tentacles and tentacular cirri; the cirrophore is a thick and conspicuous eminence. The ventral cirrus is attached distad of the middle; it is a short, slender, subulate process not reaching to the end of the neuropodium.

No notopodial setae detectable on any parapodia of the type. The neuropodials are arranged in subvertical series which may embrace eighteen to twenty-four setae spreading out from each other distally. In the type they are colorless. There are two types of neuropodials which are the extremes in a series in the parapodia of the middle region. The most dorsal setae are longer and proportionately more slender; the distal pectinate division is longer and more slender, from the thickened proximal end narrowing to a long and slender tip. The more ventral, shorter, setae have the heads or pectinate division proportionately stouter and shorter, these curving moderately, the concavity on the non-pectinate side. The tip is bifurcate, the principal tooth short and stout, convex on one side, opposite the pectinae; the minor tooth is much smaller, acute, curving a little away from the principal one. In going caudad the setae become shorter and stouter, the pectinate terminal division being markedly proportionately stouter and shorter. Cephalad the setae become of the more slender type. (Plate **5**, fig. 7–9).

The elytra are small as usual, leaving much of the dorsum uncovered. Each is thin, transparent, wholly smooth and subovate (anterior) or more commonly subelliptic in outline. (Plate **5**, fig. 5, 6). They decrease in size caudad. The precise number could not be determined with entire certainty but is either twenty-seven pairs or very near that number.

Locality. Off Mexico. Sta. 3424 (lat. 21° 15′ N., long. 106° 23′ W.). Depth, 676 fms. Bottom, grey sand with black specks. Bottom temp., 38° F. 18 April, 1891. One specimen. The specimen unfortunately seems at some time to have been dry.

In comparison with *L. irregularis* Ehlers (Zool. jahrb. Suppl., 1901, **2**, p. 255) from the south Chilean coast, this is seen to be a much shorter form with but fifty-six parapodia bearing somites as against eighty-seven in that species. The parapodia are proportionately much longer. The elytra are colorless, thin and transparent whereas in *irregularis* they are thick and dark grey or black. The tentacles are more slenderly and uniformly acuminate as are also the palpi, not abruptly narrowed to the slender tip. The setae are much more numerous and differ in details of structure.

IPHIONE Kinberg.

Annulata nova, 1855, p. 12; Fregatt Eugenies Resa. Zool. Annulater, 1857, p. 8; DARBOUX, Bull. sci. France et Belgique, 1900, **30**, p. 108.
Eumolphe BLAINVILLE, Dict. sci. nat., 1828, **57**, p. 457 (in part).
Iphionella McINTOSH, Challenger Annelida, 1885, p. 58.

IPHIONE OVATA Kinberg.

Öfvers K. vet. akad. Förh., 1857, **14**, p. 383; Fregatt Eugenies Resa. Zool. Annulater, 1857, p. 8, pl. 3, fig. 8, 8a–8h; 1910, pl. 10, fig. 45, 45e; BAIRD, Journ. Linn. soc. London. Zool., 1865, **8**, p. 181.

LOCALITY. Paumotu Islands: Rangiroa Island, Mohican Reef. 23 September, 1899. One specimen.

The specimen, which, like those of various related species, presents a striking resemblance to certain chitons, is 17 mm. long and 10 mm. wide across the middle. Kinberg's type, taken on Oahu near Honolulu, is a considerably smaller specimen, its measurements being given as 12 mm. long and 7 mm. wide; but in other respects the Rangiroa specimen agrees essentially with Kinberg's account so far as it goes.

ADMETELLA McIntosh.

Challenger Annelida, 1885, p. 124; DARBOUX, Bull. sci. France & Belgique, 1900, **30**, p. 103.

ADMETELLA HASTIGERENS, sp. nov.[1]

Plate **9**, fig. 6–8.

In the preserved type there are no distinctive features in the coloration. The body throughout is a grayish yellow. The acicula and setae are yellow, the acicula in part darker, more bronze colored.

The body is fusiform, being conspicuously narrowed from the middle toward each end, the caudal and cephalic narrowing being equal or very nearly so. Convex both above and below but the venter mesally with a wide and conspicuous neural depression or furrow in which is a large neural ridge. Integument thin and transparent along a well-defined median longitudinal band. Total length of type, 80 mm.; greatest width, exclusive of parapodia, 8.5 mm.; to tips of parapodia, about 20 mm.; to tips of acicula, near 27 mm. The number of segments is sixty-eight to seventy.

Prostomium decidedly wider than long, being transversely oblong; the length (about 1.5 mm.) about three fourths the width (2 mm.). Constricted at the base. Bulging out on each side, a large rounded prominence which shows a darkening but no evident eyes. The anterior margin is wide and nearly straight, with no median incision. The ceratophore of the median tentacle arises caudad of the middle; it is large, and on each side has a very conspicuous extension from its base. Each lateral extension is connected with the ceratophore by a narrow isthmus beyond which it is swollen, conical, and projects upward and forwards distally. Above the swollen portion adjacent to the isthmus it is narrowed conically to a slender filament of moderate length; the total length of the appendage is apparently less than twice the length of the head; these appendages correspond to the tentacular scales noted by McIntosh in his description of *A. longipedata* and as corresponding to those in the Sigalionidae. The lateral tentacles, or antennae, are broken off; each is inserted on the anterior face near the ectal corner, and apparently projected directly cephalad; what appears to be a portion of the style of one was found adhering to the border of the mouth, this is a slender terete body ending in a slender filament not preceded by an enlargement. The palpi are large, terete, and gradually acuminate, the tips very slender and ending in a filament which seems to be easily caducous; smooth; near 1 mm. thick at base and 8 mm. long, or six times the length of the prostomium. (Plate 9, fig. 6).

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[1] hasta, lance, and gerere, to bear.

The peristomium is slightly exposed above as a narrow transverse fold caudad of prostomium. The ceratophores of its parapodia are prominent.

The metastomial somites are all distinctly differentiated; those of the anterior and middle regions of a nearly uniform length (width in anterior region near 3.4 times the length, in the widest middle region near 4.8 times), in the caudal region decreasing conspicuously. Pygidium small, pointed. The nephridial papillae arise at each ectal end of the ventral surface of the somite at the middle adjacent to the parapodium rather than at the caudal edge, as more usual, the caudal margin of the somite more or less extended immediately mesad of the papilla; they begin on the sixth somite; the anterior ones are small, subcylindrical structures somewhat narrowed distad and then a little flaring about the terminal face, each extending caudad and a little dorsad into the intersegmental cleft; farther caudad the papillae become conspicuously, stouter, decreasing again in the caudal region.

The elytra are all missing. The elytrophores are mostly conspicuous, with the usual somewhat ear-shaped scar. They occur on the second, fourth, fifth, seventh, and alternate somites to the twenty fifth, then on the twenty seventh, twenty ninth, thirty second, thirty fifth, thirty eighth, forty first, forty fourth, forty seventh, fiftieth, fifty third, fifty fifth, fifty seventh, sixtieth, and possibly on one or two others, the condition of the caudal end making it difficult to be certain; the total number is thus a little above twenty-five pairs.

The parapodia are conspicuously elongate as in the immediately related forms, each, exclusive of its acicular process, being about as long as its somite and, inclusive of this, much longer. Each is, at its broad base, strongly compressed in an anterocaudal direction; in view from cephalic or caudal side, it is seen to narrow strongly to near the middle of its length, from where the neuropodial branch continues of nearly uniform width to the distal end which is oblique, its anterodorsal end elevated, and the aciculum passing through it. The notopodium is a small but clearly separated lobe arising on the dorsal surface near the base of the neuropodium; the ventral edge of its distal end is prolonged into a slender acicular process similar to that of the neuropodium; the aciculum shorter and more slender than that of the neuropodium.

The parapodial cirri are all lost and nothing definite concerning them can be affirmed from examination of the type.

There is a single aciculum in each branch of the parapodium. The notopodial aciculum is yellowish, the coarser and longer neuropodial dark brown. Both acicula project widely beyond the tips of the acicular processes. No notopodial setae are detected in the type. On the distal end of the neuropodium is a group of fine, delicate, and transparent setae which are very much shorter than the projecting ends of the aciculi. These setae are flattened structures of vitreous appearance; viewed from broad surface each is seen to be parallel-sided from the base to a triangular tip of which one side is nearly straight, the other oblique; the tip is entire, not at all incised or bifid, though it is weakly indented or notched at the base on its more oblique side and less so on the opposite one; serrations occur along both borders, and along the ridge the arrangement and development of these is very regular, the serrations not developed on the acuminate terminal division or these vaguely developed on the more oblique side alone; the thickened serrate edges seem to be bent up as far as the tip so that the seta appears concave; in side view the seta is narrow, the tip, over which the serrate thickened borders do not extend, appearing abruptly much thinner and very acute. (Plate 9, fig. 7, 8).

Locality. Off Panama: Sta. 4,621 (lat. 6° 36′ N., long. 81° 45′ W.). Depth, 581 fms. Bottom of green sand. Bottom temperature, 40.5° F. 21 October, 1904. One specimen.

This species in its general structure much resembles *A. longipedata* McIntosh, secured by the Challenger from near Prince Edward Island (1,378 fms.). It is like this species in having no notopodial setae, the long protruding aciculum being alone present; but the notopodial branch is more distinctly developed and arises farther proximad, the acicula extend farther beyond the parapodial lobes proper, and the ventral setae lack the characteristically bifid apex of those of *A. longipedata*. *Admetella renotubulata* (Moore), described from a specimen taken off Santa Catalina Island (2,196–2,228 fms.), is also evidently a closely related species; but it is readily separated by the clearly different form of the neuropodial setae, and the presence of notopodial setae, the latter not having been detected in the other two species. All these species lack pigmented eyes, though structures possibly representing modified eyes are noted in *renotubulata*.

ADMETELLA DOLICHOPUS, sp. nov.[1]

Plate **10**, fig. 1.

There is nothing distinctive in the coloration of the preserved specimen, the body appearing obscure yellow, the parapodia a somewhat lighter yellow, and the acicula nearly colorless.

The body is fusiform, in general as in *hastigerens*, but the caudal region is more strongly narrowed, becoming slender and subacutely pointed. The dorsum is convex; its integument presents a thinner, middorsal, longitudinal stripe which is semitransparent. The venter is more depressed; it has a wide longitudinal neural furrow in which lies a conspicuous neural ridge as in the preceding species. Total length of the type 60 mm.; greatest width, exclusive of the parapodia, about 5 mm.; to ends of extended parapodia, exclusive of acicular processes, near 20 mm.; to ends of acicula, near 24 mm. Total number of somites in the type sixty or within one or two of that number; in the paratype, fifty-seven.

Prostomium about two thirds as long as wide, transversely oblong, the anterior margin straight or nearly so between the widely separated ceratophores of the lateral tentacles; on each side posteriorly a prominent lobe projects laterad, neither this lobe or any other part of the prostomium showing any trace of pigmentation. The ceratophore of the median tentacle is a very large body inserted dorsally caudad of the middle of the prostomium; its diameter proximally is equal to half the greatest width of the prostomium as a whole; it is rounded and narrows abruptly above to the level of base of the style; at each anterolateral corner it is extended as a prominent, distally gradually narrowing ridge reaching to the anterolateral corner, these ridges corresponding to the large free lobes attached to the ceratophore in the preceding species; style missing in the type. The ceratophores of the lateral tentacles are attached near the anterolateral corners, each projecting slightly ectad of directly forwards; the ceratophore is a very short, proportionately thick, cylindrical body; the style is abruptly much thinner, its length not far from twice that of the prostomium; it narrows gradually distad to a moderate, subterminal, fusiform enlargement beyond which is a slender terminal filament. The palpi in the type are near 9.5 mm. long, or seven or a little more times as long as the prostomium; each is terete and slenderly tapering, subulate, ending in a rather fine tip. (Plate **10**, fig. 1).

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[1] δολιχός, long, πούς, foot.

The parapodia of the peristomium project on each side in the usual position; the ceratophores of the cirri reach forward about to the level of the anterior margin of the head; the dorsal cirri are much longer than the lateral tentacles but considerably shorter than the palpi; each has the form of the style of a lateral tentacle.

The metastomial somites are all clearly differentiated below, less distinctly above; they are comparatively long, in the widest part of the body being near one third as long as wide; they are of nearly uniform length over most of the body but in the most caudal region decrease to the pygidium as in the preceding species. The anus is terminal or slightly more dorsal, its border radially ridged or tubercular, no styles present in the type. The nephridial papillae in the anterior region are very minute and at first scarcely evident; in the middle region they are much larger but still comparatively small; each is subconical with the narrowed tip bent a little dorsad as usual; each is attached at the extreme caudal margin of the somite.

The elytra are all missing from the type-specimens. Elytrophores prominent, borne on the base of the parapodia and movable with these; present on somites II, IV, V, VII and alternate somites to the twenty fifth as usual, then on the twenty eighth, thirty first, thirty fourth, thirty seventh, fortieth, forty third, forty sixth, forty ninth and fifty second and what seems like the fifty third, the total being twenty-three.

The parapodia are much elongated, each, exclusive of aciculum, being much longer than the width of the somite to which attached as indicated by the measurements previously given. Each is strongly flattened in the cephalocaudal direction; each narrows strongly from base to near the middle of the length, the proximal region in outline subtriangular, its dorsal side strongly slanting, its ventral horizontal and continuous in direction with that of the remaining more slender portion of the parapodium. Neuropodium long, but little varying in thickness in different parts of its length except toward the distal end where subconically narrowed, the distal end oblique with acicular process at the more projecting dorsal corner. The notopodium is a distinct, well-separated lobe, subcylindric at the base and distally formed much like the neuropodium, which arises on the dorsal surface a little distad of the middle of the parapodium. At the base of each non-elytrophorous parapodium there is above, a characteristic, short, distally rounded, subcylindric process. Just proximad of the notopodium is the dorsal cirrus, which from the traces alone left in the type, seems to have been small. The ventral cirri are also lost excepting on a few anterior pairs; on the second metastomial parapodia the cirrus is attached near or a little distad of the middle of the length, and extends clearly distad of the end of the parapodium; on the following pair of parapodia the cirri are shorter and scarcely exceed the neuropodium proper distally, though on one side the cirrus of the third somite is elongated like that of the second; the cirrus is slender with a slight subterminal thickening and a fine terminal filament.

The acicula are pale, more or less vitreous in appearance. Each projects but moderately beyond its slenderly conical process, very much less exposed than in the preceding form; distally it is very fine and easily bent back into a curl. All setae appear to have been broken off, no complete ones being detected in either of the types.

Locality. Off Mexico: Sta. 3425 (lat. 21° 19′ N., long. 106° 24′ W.). Depth, 680 fms. Bottom of green mud and sand. Bottom temp., 39° F. 18 April, 1891. Two specimens.

Characterized especially by the form of the lateral prolongation of the median ceratophore; instead of rising free from the prostomium as in the preceding species, these extend as simple but conspicuous ridge-like elevations out to the bases of the lateral tentacles. The feet are relatively decidedly longer than in *hastigerens*, each in length much exceeding the width of the somite to which attached. The forms of the notopodial processes and especially of the basal dorsal processes of the interelytrophorous somites are characteristic.

POLYNOE Savigny.

Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 20; MCINTOSH, British annelids, 1900, **1**, pt. 2, p. 389; DARBOUX, Bull. sci. France & Belgique, 1900, **30**, p. 11.
Lepidonotus QUATREFAGES, Hist. nat. annelés, 1865, **1**, p. 257 (in part).
Parapolynoe CZERNIAWSKY, Bull. Soc. imper. nat. Moscou, 1822, **57**, p. 187.

POLYNOE INNATANS, sp. nov.[1]

Plate **8**, fig. 1–7.

Pale and semitransparent.

The body is widest in front of the middle and from there widens very gradually caudad and more abruptly cephalad. The greatest width, exclusive of the parapodia, is 1 mm.; inclusive of parapodia, but without setae, 2 mm.; to tips of setae, 3.5 mm. Length 9.5 mm.

Prostomium decidedly wider than long; divided by a median longitudinal furrow; bulging on each side in the usual manner. Eyes large, black, distinct, the anterior the larger and much farther apart; posterior eye on each side close to anterior, separated by much less than its diameter. Median ceratophore attached somewhat higher up or more dorsally than the lateral, longer than the latter, narrowing distad; style, which in the type is detached, much larger than the palps, cylindrical, narrowing to a fine filament distally, sparsely, minutely spotted with dark, and more solidly darkened near the middle. The ceratophores of the lateral tentacles more cylindrical, short; the styles extremely short, narrowed abruptly to a fine terminal filament which about equals in length the proximal division and ceratophore together; the entire lateral tentacle, inclusive of its ceratophore, does not greatly exceed the prostomium in length. Palps short, abruptly narrowed distally in a conical tip.

The parapodia of the peristomium extend obliquely cephaloectad as usual; the ceratophores reach or extend a little in front of the level of the anterior border of the head proper. At least one conspicuous curved seta. The styles of the cirri are cylindrical and slenderly acuminate distad, the dorsal exceeds the ventral, and both exceed the palps.

Segmental papillae arranged as usual. Each is situated at the base of a parapodium at the caudal edge and is a short conical process ending in a narrower subcylindrical short tip which bends a little dorsad, the papilla as a whole extending caudoectad.

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[1] innatare, to float.

Parapodia shorter than the somite to which attached, decreasing in length cephalad and caudad. A typical parapodium is deep dorsoventrally at the base and outward to the low, stout notopodial process which is distad of the middle; the neuropodium beyond the notopodial elevation narrows subconically; distally it is obliquely subtruncate and is extended above into a short, slender, finger-like process. The dorsal cirrophore is a stout, subconical joint arising just proximad of the middle; no styles were found in the type, all appearing to have been lost. The ventral cirri are attached toward the distal end close to the setae; the cirrophore is a thick, rounded lobe; the style is smaller at the base, then conspicuously and continuously narrowing to the slender tip; extending well beyond the distal end of the neuropodium but not reaching the tips of the setae. Ventral cirrus of the first metastomial parapodia attached farther toward the base, much longer than the others, and attaining or nearly attaining the distal ends of the setae.

Most of the elytra are missing from the type. Those present are thin and transparent. They extend outward on the parapodia as far as the notopodia, the setae of which extend from beneath the outer edge of the elytra. Elytra well overlapping both mesally and anterocaudally. The elytra are subcircular, with two or more weak notches on the exterior side opposite the notopodial fasciae. The exterior and anterior parts of the elytra are nearly uniformly covered with numerous, small, low tubercles each of which has a somewhat hemispherical basal portion and an abruptly narrower short, conical, apical portion which is commonly bent toward one side.

The acicula are colorless. The notopodial is stouter than the neuropodial, but slightly curved, its acute apex protruding among the setae. The neuropodial typically presents a more distinct and double curve; its acute distal portion extends through the finger-like process of the neuropodium. The notopodial setae are arranged in a whorl on the distal end of the notopodium; they are typically ten to twelve in number; there are two principal types, a posterior group of larger, weakly and evenly curved setae, and an anterior group of smaller ones most of which are abruptly bent at the beginning of the pectinate distal division and are much the widest in the region of the head and somewhat boomerang-shaped. The notopodials of the first type have over the distal portion along the convex edge a series of mostly near eight scales which are widely separated; the tip is distinctly bifid, but is frequently broken off. (Plate 8, fig. 2). Those of the second type have along the convex edge distad of the bend a series of mostly near twelve more closely arranged scales; the tip weakly bifid. (Plate 8, fig. 1). The neuropodial setae are much more numerous, commonly near twenty-five in number. They are also much more slender than the notopodials. Each has a long slender shaft and a head or distal scale-bearing division which is enlarged at the proximal end and runs out to a slender acute tip like the head of a spear; in one view the seta is a little curved proximad of the head; along one side of the head (the side of the convexity of the seta) are two rows of scales and distad of these there is a distinct subapical tooth. (Plate 8, fig. 6, 7). In the more anterior setae the heads are much shorter than in the posterior ones. (Plate 8, fig. 5). In addition there is a third type of notopodial setae; these are longer and stouter than the others and are straight; they are acuminate distad in the usual way; in place of a single series of pectinae there are five or six ranks of these. (Plate 8, fig. 5).

None of this third type was found cephalad of the eighth (seventh metastomial) segment, in the fascia of which two were noted, but they occur on the segments caudad of this and project conspicuously beyond the others.

Locality. Between Galapagos and Paumotu Archipelagos: Sta. 4728 (lat. 13° 37′ 40″ S., long. 114° 22′ W.). 19 January, 1905. One specimen taken at 300 fms. to surface.

This species is well characterized by its remarkably reduced lateral tentacles, the character of the elytra and their papillae, and the structure of the setae.

POLYNOE NESIOTES, sp. nov.

Plate 8, fig. 8; Plate 9, fig. 1–5.

The body is short and compact, exclusive of the parapodia having its greatest width at about the ninth somite, from where it narrows very slightly cephalad and gradually caudad; inclusive of parapodia the greatest width is a little farther caudad; the dorsal surface appearing flat with the parapodia rising obliquely at the sides; the ventral surface is smooth, a wide neural ridge present. The total length at present is about 22 mm.; the greatest width, exclusive of the parapodia, 3 mm.; inclusive of the parapodia but without setae, 4.6 mm.; over all, 5.6 mm. Number of somites thirty-four.

The color of the body at present is dark brown, but as the specimen appears at some time to have been dry this is scarcely of significance. The neuropodial setae are pale yellow; the notopodials colorless or white.

The prostomium is so shrunken in the type that its original form cannot be stated. The ceratophores of the tentacles are cylindrical and parallel, the median a little exceeding the lateral. The tentacles are comparatively thick;

they appear to have ended in an abruptly more slender terminal filament. The palpi end in slender tips. The prostomial appendages in the type are deformed from shrinkage and so cannot be more fully described.

The parapodia of the peristomium bear two or more setae above. The cirri are thick and cylindrical like the tentacles and similarly have a reduced tip.

The metastomial somites are distinctly separated. They are of nearly uniform length excepting at the caudal end of the body where they are reduced. The pygidium is a small short process bearing distally two anal cirri of the general form of the parapodial cirri and each with a subapical dark annulus.

The parapodia are moderately short and stout, distally conically narrowed and compressed cephalocaudally; the ventral surface is less slanting than the dorsal. The notopodium appears as a small but distinct tubercle on the dorsal surface of the neuropodium near the middle; its setae, much finer and paler than the neuropodials, do not reach the end of the neuropodium. The ventral cirrus is attached proximad of the middle of the parapodium; it is short and acuminate, ending in a slender tip and falling much short of attaining the end of the neuropodium; the ventral cirri of the parapodia of the second somite, however, are, as usual, much longer, each being stout, terete, and uniformly acuminate to a slender acute tip which surpasses the setae. The dorsal cirrus of a typical parapodium has a stout, subconical cirrophore; the style is terete and distally subulate, narrowing gradually to a slender, acutely pointed tip; distally there is a broad, black annulus and some of the cirri, at least, also appear darker towards the cirrophore; the cirrus extends beyond the distal end of the parapodium.

A single stout aciculum in each ramus, that of the neuropodium emerging toward the dorsal side of the end. The notopodial setae are much finer and shorter than the neuropodials. They form a small but conspicuous white fascia, the setae of which do not attain the distal end of the neuropodium. Each notopodial is thickest proximally and narrows distally regularly to a slender and very acute tip; excepting for a smooth slender tip and the proximal end, there is along the entire length a series of transverse scales or plates in which divisions are indicated by longitudinal lines, but the teeth non-divergent, closely appressed; the plates are close set and overlap much; they are evident all along one side but usually are evident only more distally on the other or in some in certain views may not project on the opposite side at all. The medulla is finely fibrillar as usual. There is a tendency for much foreign material to adhere to the notopodials. The neuropodials greatly exceed the notopodials in thickness and length. Each neuropodial has a smooth shaft, which is slightly curved between the point of emergence and the head or pectinate division toward which it thickens slightly. The head is bent at a small angle to the shaft as usual. It narrows to a rounded point distad and is gently concave on the side bearing pectinae and convex on the opposite; it presents an acute subapical tooth which diverges but little from the principal tooth. The pectinae extend about halfway from the base to the apex, sometimes a little more and sometimes a little less. (Plate **8**, fig. 8; Plate **9**, fig. 1, 2).

The elytra are firmly attached and are strongly imbricated. Those of the first pair are small and subcircular in outline; a rather narrow border on each is smooth or only very minutely granular, while the large area within is thickly studded with large tubercles or papillae which are subconical, the distal portion being softer and a basal portion denser and more opaque and appearing by itself hemispherical; the papillae seem to be all of the same type excepting for variation in size, those toward the periphery of the papillose area becoming smaller. The succeeding elytra become much larger in size and are more elongate, being broadly subelliptic to subovate. On the second elytra large papillae similar to those of the first occur over and immediately adjacent to the area of attachment, but elsewhere the papillae are much reduced and anteriorly especially are sparse, leaving considerable areas smooth. Toward the middle region and farther caudad the elytra become almost smooth, losing the larger papillae, while the smaller ones become reduced to minute granule-like bodies which may be present only on restricted areas of the surface. There are fifteen pairs. (Plate **9**, fig. 4, 5).

LOCALITY.— Lower California: Santa Margarita Island. Exped. 1891. One specimen which at some time had apparently been dry.

As a species characterized especially by the structure of the setae and elytra.

LEPIDONOTUS Leach.

Ann. philos, 1819, **14**, p. 205; DARBOUX, Bull. sci. France & Belgique, 1900, **30**, p. 109 (in part); McINTOSH, British annelids, 1900, **1**, pt. 2, p. 273.
Eumolpe BLAINVILLE, Dict. sci. nat., 1828, **57**, p. 457 (in part).

LEPIDONOTUS JOHNSTONI Kinberg.

Öfvers, K. vet. akad. Förh., 1855, **12**, p. 384; Fregatt. Eugenies Resa. Zool. Annulater, 1857, pl. 4, f. 13-13b; 1858, p. 12; 1910, pl. 10, f. 15; BAIRD, Journ. Linn. soc. London. Zool., 1865, **8**, p. 182.

LOCALITY.— Off Panama: Perico Island. Shore. 26 October, 1904. One specimen.

This is the type-locality for the species, Kinberg stating that his specimens inhabited "litora insularum prope Panama."

Lepidonotus nesophilus, sp. nov.[1]

Plate 4, fig. 1–7; Plate 5, fig. 13.

The general form of the body is rather slender for this genus, the outline as seen from above being narrowly oblong; the sides straight from near the end of the anterior fourth caudad, more strongly so near the caudal end, where the venter proper is seen to run to an acute point; narrowed also a little cephalad from the level of greatest width, the anterior end convex. Dorsal and ventral surfaces moderately and about equally convex. The total length of type is 27.5 mm.; the greatest width, exclusive of the parapodia, is 4.8 mm.; inclusive of parapodia, 7 mm.; and inclusive of the setae, 8.2 mm.; the width across dorsum to the edges of the scales is 6.8 mm.; and the greatest depth of body is 4.2 mm.

The color of the elytra is greyish green, paler toward the ectal side; a larger light spot is over the point of attachment and numerous small light dots about this. The color of the venter and of the dorsum where exposed along the mid-dorsal line is more dilute and with less suggestion of green. The setae are brown, darker at the tips.

The prostomium is convex with the sides behind well rounded; in front it presents the two conspicuous, subcylindrical processes forming the lateral tentacular ceratophores, each lateral half of the prostomium inclusive of these ceratophores being somewhat pyriform, a shallow longitudinal median furrow bisecting it above. The surface is weakly transversely wrinkled. Eyes black. General surface pale in contrast with the ceratophores, which are blackish. (Plate 4, fig. 1).

Ceratophore of median tentacle thick, subcylindrical, widening distad, half the length of the prostomium proper. The style is only twice as long as the prostomium, strongly tapering from the base distad, with the usual subterminal enlargement which is elliptic in outline, this followed by the slender apical filament which about equals the subterminal enlargement in length; the style is blackish but with a light colored annulus just proximad of the enlargement and the terminal filament again pale.

Ceratophore of the lateral tentacle four fifths or more the length of the

[1] νῆσος, island, and φίλος, loving.

median ceratophore, and about three fifths as thick distally. The ceratophore and filament are blackish with the light subterminal and terminal portions as in the median tentacle. The lateral tentacles are decidedly more slender than the median and are about two thirds as long. (Plate 4, fig. 1).

The palpi are stout structures projecting laterally beyond the prostomium; they are much thickened or swollen a little above the proximal end, where they narrow evenly and conspicuously to an acute point, but present no abruptly thinner apical filament. In length they about equal the median tentacle. They are pale throughout.

The parapodia of the peristomium are long, reaching much beyond the tip of the tentacular ceratophore, the portion distad of this level being fully three fourths the length of the ceratophore. The cirri agree in form and color with the tentacles; the dorsal cirrus is rather longer than the lateral tentacle and ventral one clearly and considerably shorter than the dorsal. (Plate 4, fig. 1).

The body, as usual, has twenty-five setigerous somites following the peristomium. The nephridial tubercles begin on the sixth somite. On this somite the tubercle is short and inconspicuous but on the others the tubercles are prominent; each projects ectocaudad and ventrad and at the distal end is clavately swollen and may curve more strongly ventrad.

A pair of low dorsal tubercles occur on somite I and also less prominently on II and III, but on succeeding somites none are evident in the type.

There are the usual twelve pairs of elytra occurring on somites II, IV, V, VII and succeeding odd numbered somites to XXIII. The elytrophores are prominent, cylindrical or subcylindrical trunks with broadly elliptic cross-section, or these somewhat flattened or indented on one side; similar but more rounded prominences occur on the somites not bearing elytra. The elytra are broadly subelliptic membranous scales of moderate size with their long axes *in situ* in most oblique. They may meet at the middle of the dorsum but do not overlap and may have a narrowed naked stripe between them; the elytra in the series on each side overlap a little but the imbrication is not particularly strong. On the first elytra there is a series of rounded bosses or tubercles along the caudal border and continuing along the ectal but not the mesal end; those over the middle of the series are large and the others decrease in size from there both ways; these tubercles are separated by a distance mostly two or three times their own diameter; in front of this submarginal series, over the dark areas of the surface and also over the area of attachment, are scattered other similar rounded or hemispherical tubercles of large size with among them similarly formed ones of smaller size; over the light area along the anterior and ectal border there are numerous tubercles of mostly very small and minute size. On scales farther caudad the surface becomes almost wholly smooth, the large tubercles being wholly absent and a few very small ones with more numerous minute points confined mostly to the ectocaudal border within the fringe. Along the ectocaudal edge of the elytron there is a series of short and slender transparent rods projecting freely from the edge. (Plate 4, fig. 2, 3, 6).

The tubercles vary from hemispherical to forms constricted at the base and so more nearly spherical. The tubercles are densely spinescent, the spines being proportionately longer and coarser on the smaller tubercles. (Plate 4, fig. 4, 5).

Each typical parapodium presents a stout, strongly conical neuropodium which is slightly rounded or oblique across the distal end from which the setae project. From the anterodorsal surface of the parapodium the notopodium projects as a small lobe. The ventral cirrus is a short, acuminate process the tip of which, when the cirrus is extended against the neuropodium, reaches the bases of the neuropodial spines. The dorsal cirrus is about three times as long as the ventral; it presents a stout subconical ceratophore which is about one third of the total length; the filament is of the same form as the tentacular cirri and tentacles, presenting a subterminal enlargement and terminal filament; the cirrus is pale throughout except for a blackish annulus over the base and one proximad of the subterminal enlargement.

The ventral cirri of the first parapodia as usual are much longer than the others.

The anal cirri are broken off in the type-specimen.

The notopodial setae are either straight or, more typically, curved over their exposed portion. The exposed portion widens from the base to near the middle of the length and then narrows distad to a point. Each seta appears in surface view bipinnate, there appearing a fringe of close-set transparent fine teeth along each side, but those of the convex side are decidedly longer and extend along the seta farther than those of the opposite side. There is a series of longitudinal lines or teeth across each segment as shown in Plate 4, fig. 7, these decreasing in length from the convex side to the concave. Only one type of seta was noted. The cortex shows a jointing, the cross-lines being distinct and closely arranged and corresponding to the serrations. (Plate 5, fig. 1).

The neuropodial setae are longer and much coarser than the notopodials, as usual. The tip in those of the anterior somites is as long as the serrate portion below it; it is but slightly curved, being convex on the abdental side and nearly straight on the dentiferous, on which side is present a characteristic obtuse angle a short distance below the apex, from which a slender tooth normally projects distad; this tooth is easily lost; this subapical tooth was not found in setae of posterior segments. The teeth of the most distal row are long, stout, and acute; this row is followed by five to nine small series of teeth which diminish in size proximad. (Plate 5, fig. 2, 3).

LOCALITY.— Galapagos Archipelago: Chatham Island. 8 January, 1905. One specimen taken on the shore.

A well-marked species easily distinguished by its general form and the size, structure, and relations of the elytra as well as by the structure, proportions, and coloration of the prostomium and its tentacles and palps, and the structure of the setae. It approaches *L. versicolor* Ehlers of the Chilean Coast but differs conspicuously in its much stouter and differently formed palps, the proportions of the other anterior appendages, form of head, structure of the elytral tubercles, the larger smooth tip of the neuropodial setae and in other details.

APHRODITIDAE.

In this family the body is proportionately broad and short, having an oblong or subelliptic outline; depressed, with dorsum arched and venter flat.

Prostomium distinct. Eyes usually two pairs, either sessile or pedunculate. A single median tentacle with beneath it a distinct facial tubercle. Lateral tentacles none, or rarely present (in Triceratia only). A pair of large palpi.

Peristomium bearing two pairs of long tentacular cirri and mostly setigerous.

Parapodia biramous, some bearing dorsal cirri and others elytra in their place. The elytra occur on somites II, IV, and V, and on most of the succeeding somites in alternating groups of twos or in the posterior region in part in groups of threes; usually imbricated.

Setae all simple, strongly developed. The dorsal setae long, consisting of stout spines and finer capillary forms, directed typically upwards and backwards over the elytra and dorsum. Capillary setae often iridescent, with hair usually more or less felted over the dorsum and covering the elytra.

Pygidium bearing two anal cirri similar to the ordinary notocirri.

The proboscis bears no jaws, or these but rudimentary, ordinarily represented merely by thickened muscular prominences.

The aphroditids, while occurring to some extent in the shallow water along the shores, live for by far the most part at greater depths. The Albatross dredged *Laetmonice wyvillei* from the excessive depth of 3,120 fathoms. Both the bathymetrical and the geographical range with certain species is very great. Another species of Laetmonice, *L. benthaliana* McIntosh, has been taken at only twenty-six fathoms on the one hand, and on the other, at 2,900 fathoms (Challenger Annelida, 1885, p. 40, 45). The geographical range of *Laetmonice productor* is enormous. Some forms burrow in the mud, a process in which the spines seem to be instrumental. This habit accounts for the fact that the setae and elytra of certain species are commonly found coated with mud. The aphroditids are sluggish in movement. They often occur as commensals and give support to a great variety of external parasites such as other annelids, protozoans, sponges, coelenterates, echinoderms, bryozoans, crustaceans, and tunicates.[1] Thus, in speaking of *Laetmonice productor* McIntosh (Challenger Annelida, 1885, p. 43) says:— "A large number of parasitic growths — sponges, Foraminifera, diatoms, hydroid zoöphytes, Polyzoa, Loxosomae, ascidians, entangled worms, and others in tubes of sponge-spicules — occur amongst the bristles." All are carnivorous, and eat a great variety of animals, including other aphroditids and annelids in general.

Key to Genera.

a. Lateral tentacles as well as a median one present.......................... *Triceratia* Haswell.
aa. With only a median tentacle.
  b. Eyes implanted on base of antenna; dorsal hairs not felted over the elytra; no arrow-shaped setae; ventral setae with bifid tips.................................. *Aphrogenia* Kinberg.
  bb. Eyes not on base of antenna; dorsal hair more or less felted.
    c. Eyes pedunculate.
      d. Hairs of notopodium in part arrow-formed; dorsal felting loose and often incomplete.
        e. Neuropodial setae with the. tips bifid, distal region not pectinate.... *Laetmonice* Kinberg.
      dd. Notopodial setae simply serrate along convex side or smooth, but never arrow-formed, long, prone, dense.. *Pontogenia* Claparède.
    cc. Eyes sessile; dorsal felting very dense, irregularly pierced by large brown hairs; parapodia with many fasciae of irised hairs.. *Aphrodita* Linné.

Aphrodita Linné.

Linné, Syst. nat., ed. 10, 1758, **1**, p. 655; McIntosh, British annelids, 1900, **1**, pt. 2, p. 241.
Halithea Savigny, Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 11, 18.
Milnesia Quatrefages, Hist. nat. annelés, 1865, **1**, p. 211 (min. ad part. *M. borealis*).
Aphroditella Roule, Bull. Mus. hist. nat., 1898, **4**, p. 191.

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[1] For a detailed account of both external and internal parasites in the several groups of Aphroditoidea see G. Darboux, Recherches sur les aphroditiens. Bull. sci. France & Belgique, 1900, **30**, p. 18 *et seq.*

APHRODITA DEFENDENS, sp. nov.[1]

The prostomium is a little longer than wide, shortly inversely subpyriform, being widest in front. Convex above and in front. On dorsal surface toward anterior end are two slight rounded tubercles, but no eyes could be definitely discovered in the types; if present, they are colorless and obsolete. The median tentacle in the type is very short and clavate, apparently representing only the ceratophore; but in the paratype the style is present as a long slender filament nearly equalling the prostomium in length. The short basal segment of palpi narrow, less than half the width of prostomium; the main part widening from base to or beyond anterior edge of facial tubercle and then regularly tapering and distally becoming slender, seven times or more the length of the prostomium, bearing numerous distinct sensory papillae. The facial caruncle prominent, compressed laterally and running to an acute edge cephalad, the dorsal surface strongly roughened, somewhat tubercular.

Peristomial parapodia laterally compressed, lying close against parapodium and proximal part of palps; the parapodia proper surpassing the prostomium by less than one and a half the length of the latter. Tentacular cirri arising near distal end on ectal side, the dorsal stouter than the ventral. Setae of peristomial parapodia all capillary, in flat tufts. Lower lip an elongate lobe as usual, occupying middle region of II and III and pressing against IV; its sides incurved.

Metastomial somites beneath a little convex laterally with greater part between nearly flat. Very clearly separated from each other by transverse folds and from the parapodia by the usual deep furrow. Surface densely crowded with papillae which are commonly even more dense and conspicuous on the parapodia.

The elytra are large, widely overlapping and wholly covering the dorsal region of body and head. They are smooth, and rather thin but tough. The fimbriate organs rather small, widest at base, convexly narrowing distad, the edge with few, well-separated but blunt processes.

Neuropodia of middle region about one third, or a little less, the width of the somites. Neurocirrus of typical parapodium arising in usual position from a low elevation or transverse ridge; short, slenderly subulate, just attaining bases of ventral series of setae, no subterminal knot. The notocirri long and slender filaments ordinarily passing through and lying upon the felt. They lack terminal and subterminal enlargements.

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[1] defendere, to ward off or defend.

The dorsal felt is of uniform thickness, regular, tough and essentially smooth throughout.

Neuropodial setae not concealed by the felt but much shorter than in *A. echidna* McIntosh. They are all deep, almost blackish, brown in color, with the tips of some appearing paler. Arranged in the usual three series, of which the dorsal consists of two or occasionally of three, the middle mostly of five, and the ventral of eight to twelve spines, in the type mostly toward the upper limit, in the paratype, a much smaller specimen, toward the lower. The spines of the dorsal series are stout, distally somewhat compressed and longitudinally weakly sulcate down the middle of the flattened side, straight or slightly curved distally. Setae of middle series much more slender, commonly less than a half or a third the diameter of the dorsals; evenly and obviously curved beyond middle, pointed. The ventrals much more slender than the medians, more strongly curved, commonly with a soft, flexible, pointed tip.

No slender iridescent setae evident in the type, the lateral fibres all densely coated with foreign material. The notopodials in two series. In both the setae are in the form of stout straight spines, stouter than the dorsal neuropodials, those of the upper series greatly so. The spines are all straight, pointed, and erect, rising distally free from the felt or often almost wholly concealed. In each series usually three in number, of which one may be reduced in size.

Thirty-seven somites in type.

Length, about 40 mm. Width to tips of setae 30 mm.; to bases of parapodia ventrally, 16 mm.

LOCALITY. Off Aguja Point, Peru, 20 m. N. W.: Sta. 4654 (lat. 5° 46′ S., long. 81° 31′ 9″ W.). Depth 1,036 fms. Bottom, dark brown mud. Bottom temp. 37.3° F. 12 November, 1904. One specimen.

LAETMONICE Kinberg.

Öfvers. K. vet. akad. Förh., 1855, **12**, p. 382; MALMGREN, Öfvers. K. vet. akad. Förh., 1865, **22**, p. 53; ibid., 1867, **24**, p. 129, LEVINSEN, Öfvers. Nordiske Annulata, 1883, pt. 2, p. 26; ROULE, Bull. Mus. hist. nat., 1898, **4**, p. 191.

Laetmatonice KINBERG, Fregatt. Eugenies Resa. Zool. Annulater, 1857, p. 7; BAIRD, Journ. Linn. soc. London. Zool., 1865, **8**, p. 179; QUATREFAGES, Hist. nat. annelés, 1865, **1**, p. 199; EHLERS, Mem. M. C. Z., 1887, p. 44; DARBOUX, Bull. sci. France & Belgique, 1900, **30**, p. 102; MCINTOSH, Brit. annelids, 1900, **1**, pt. 2, p. 258.

Laetmonicella ROULE, Bull. Mus. hist. nat., 1898, **4**, p. 191.

LAETMONICE WYVILLEI (McIntosh).

Laetmonice producta var. *wyvillei* McINTOSH, Challenger Annelida, 1885, p. 44, pl. 7, fig. 3, pl. 4A., f. 9–11.

Laetmonice producta wyvillei TREADWELL, Bull. U. S. fish comm., 1906, 1903, **23**, pt. 3, p. 1157; MOORE, Proc. Acad. nat. sci. Philad., 1910, p. 386.

Plate **11**, fig. 1, 2.

LOCALITY. Off Peru: Sta. 4675 (lat. 12° 54′ S., long. 78° 33′ W.). Depth 3,120 fms. 22 November, 1904. Four specimens.

These specimens agree in general with the form described by McIntosh. They show the same papillose ventral surface, and the very dark, dull, coarse dorsal setae. The dorsal setae agree well in structure with those of the types excepting that the tip is perhaps proportionately a little more slender. There are three or four recurved teeth on each side but in one of the spines there are proximad of these principal teeth a series of reduced ones on each side such as noted also in certain spines of the typical *L. benthaliana* McIntosh. The ventral setae are nearly typical, excepting that the terminal hook seems longer, approaching more the condition in *L. producta* Grube; the pinnae are very numerous, seventy or more in number, and the basal hook is small and short as in the types. The ventral cirri differ in being minute, more as is typical for *benthaliana*. The precise relationship of the forms grouped under and about *producta* has yet satisfactorily to be worked out when sufficient material becomes available.

LAETMONICE BENTHALIANA (McIntosh).

Laetmonice producta var. *benthaliana* McINTOSH, Challenger Annelida, 1885, p. 45, pl. 8, fig. 4, 5, pl. 4A, fig. 12, pl. 5A, fig. 1, 2.

Laetmonice producta benthaliana MOORE, Proc. Acad. nat. sci. Philad., 1903, p. 420; IZUKA, Journ. Coll. sci. Imper. univ. Tokyo, 1912, **30**, p. 84, pl. 9, fig. 7–10.

LOCALITIES. Off Panama: Sta. 4458 (lat. 6° 30′ N., long. 81° 44′ W.). Depth 555 fms. Bottom, green sand. Bottom temp. 40.2° F. 24 February, 1891. Two specimens.

Off the Galapagos Islands: Sta. 3402 (lat. 0° 57′ 30″ S., long. 89° 3′ 30″ W.). Depth 421 fms. Bottom rock and Globigerina ooze. Bottom temp. 42.3° F. 28 March, 1891.

Between Panama and the Galapagos Islands: Sta. 4630 (lat. 6° 45′ N., long. 81° 42′ 30″ W.). Depth 556 fms. Bottom green sand. Bottom temp. 40.5° F. 3 November, 1904. Four specimens.

These specimens agree in general appearance and structure with the description of the typical examples. The ventral setae are typical excepting that the tip is somewhat less strongly hooked. The dorsal setae also agree excepting that the curvature mentioned as evident in certain views does not appear clearly in these specimens. The ventral cirri seem to be larger than in the types as they are easily seen with the naked eye.

This is a widely distributed form, having been recorded from the region of Kerguelen and from south of Australia as well as from the North Pacific. It has a large bathymetrical range, having been taken in Suruga Bay at a depth of only 26 fms. (ALBATROSS), and in the North Pacific (lat. 35° 22′ N., long. 169° 53′ E.) at the great depth of 2,900 fms. (CHALLENGER).

LAETMONICE sp.

A single specimen of a form which has been at some time dry, is in poor condition for satisfactory study.

LOCALITY. Off the Galapagos Islands: Sta. 3400 (lat. 0° 36′ S., long. 86° 46′ W.). Depth 1,322 fms. Bottom light grey Globigerina ooze. Bottom temp. 36.1° F. Exped. 1891.

PONTOGENIA Claparède.

Annélides Chétop. Golfe Naples, 1868, p. 57; GRUBE, Jahresb. Schlesch. gesellsch., 1875, p. 68; Annulata Semperiana, 1878, p. 19; EHLERS, Mem. M. C. Z. 1887, **15**, p. 46; DARBOUX, Bull. sci. France & Belgique, 1900, **30**, p. 102.

PONTOGENIA CURVA, sp. nov.

Plate **10**, fig. 2–7; Plate **11**, fig. 12.

The body in general outline is oblong, with the caudal end much narrowed as usual and the anterior end more broadly rounded. Evidently there is considerable deformation through the specimens having been at one time dry. The precise number of somites could not be determined, but there are near twenty-seven to thirty pairs of parapodia. The length of the type, exclusive of the setae, is at present near 9.5 mm. and with the setae, 12.5 mm. The width to the bases of parapodia is 3.5 m.; to the tips of the parapodia is 6 mm.; and to the tips of the setae, 10 mm. The paratype is 8.3 mm. long, with the width of body proper 3.2 mm., to tips of parapodia, 7.25 mm., and to tips of setae, 11.5 mm.

The dorsum is matted with much entangled foreign matter which wholly conceals the surface, the foreign material including even fragments of coral in addition to the finer material. The ventral surface presents numerous minute tubercles or points.

The parapodia are long and cylindroconical, the narrowing distad being very gradual. (Plate 10, fig. 8).

The ventral setae are dark brown in color. They are long, projecting between two and three millimeters beyond the tip of the parapodia. The principal setae curve decidedly toward their distal ends. Each is distally bifurcate as in such forms as *P. chrysocoma* (Claparède) and *P. sericoma* Ehlers, though differing in detail of form. The principal branch is curved with its concavity toward the minor branch or tooth and in a direction opposite to the principal curvature of the seta. The lesser tooth is straight and projects at a wide angle. The most ventral in the series are much more slender than the most dorsal ones. In addition to these there are in some of the more anterior neuropodia numerous much finer setae. These are paler in color. They vary much in stoutness among themselves in each fascicle. They may be curved much as those of the principal type above described; but instead of a single subapical tooth they present a series of small teeth below a naked tip. The series of teeth may be short, much as in the ventral setae prevailing throughout in *P. maggiae* Augener, except that the teeth in that form are fewer and shorter; but more commonly a series of teeth may extend on both sides of the setae to the middle or below, or the series on one side may be longer than on the other. Thus these setae are typically bipectinate. (Plate 10, fig. 3–7; Plate 11, fig. 2).

The dorsal setae are arranged as usual and are numerous and conspicuous. They vary in length, the shorter ones curving close to the dorsum and by their uncinate tips aiding the finer dorsal hairs in holding much foreign material. The setae in general increase much in length caudally, some of those on the posterior somites being ten millimeters in length. They all widen from the base distad to the middle region and then narrow into a long, slenderly acuminate, distal region which is apically conspicuously curved or uncinate. Each seta appears more or less flattened and grooved along one side. The edges are wholly smooth. The dorsal hairs are fine and smooth.

Locality. Gulf of Mexico: Sta. 2370 (lat. 29° 18′ 15″ N., long. 85° 32′ W.). Depth 25 fms. Bottom of coarse gray sand and broken shell. 7 February, 1885. Two specimens.

The specimens had unfortunately been at some time dry, the hardening deforming them and rendering a complete description impossible. However, as the setae furnish clearly distinctive characteristics, it has seemed advisable to describe and figure the species. *Pontogenia sericoma* Ehlers, also occurring in the Gulf of Mexico, is at once to be distinguished from the present species by its characteristically straight and strongly serrate dorsal setae; *P. maggiae* Augener, taken in the Carribean off Montserrat, is also conspicuously different in the prevailing form of its ventral setae as well as in the dorsal setae.

ACOETIDAE.

The members of this family have the body elongate, moderately flattened dorsoventrally, and composed of numerous somites.

The prostomium is without a facial tubercle. Eyes either all sessile or two of them borne on conspicuous peduncles or ommatophores. Tentacles three, two, one or none. Palpi present, long and subulate.

Parapodia biramous. Elytra occurring on somites II, IV, V, VII and thereafter alternately with the notocirri.

With setae either all simple (Acoetinae) or in part composite (Peisidicinae).

Proboscis at the end with a crown of numerous marginal papillae. Always armed with four horny jaws.

The acoetids are normally tubicolous. For special cases see, *e.g.*, Watson, Observations on the tube-forming habits of *Panthalis oerstedi*, Trans. Liverpool biol. soc., 1895, p. 9; Ehlers, Mem. M. C. Z., 1887, **15**, p. 56, under his account of *Euarche tubifex* (*Eupanthalis kinbergi* McIntosh). They are carnivorous and the most voracious of the aphroditoids.

Key to Genera.

a.	Composite setae present	*Peisidicinae.*
b.	No dorsal cirri, somites not numerous	*Peisidice* Johnson.
bb.	Dorsal cirri present; somites numerous	*Haswellia* Darboux.
aa.	With no composite setae	*Acoetinae.*
b.	Tentacles present.	
c.	With but two tentacles.	
	Two ommatophores, branchiae present	*Eupolyodontes* Buchanan.
cc.	With three tentacles.	
d.	Two eyes borne on ommatophores.	
e.	With branchiae; first pair of parapodia normal	*Acoetes* Milne Edwards.
ee.	No branchiae; first parapodia modified	*Panthalis* Kinberg.
dd.	Eyes sessile, two or four in number	*Eupanthalis* McIntosh.
bb.	No tentacles; eyes sessile	*Restio* Moore.

Synonymy of Genera.

Acoetes Milne Edwards is the same as the older Polyodontes Renier, but the latter name, being preoccupied, is not available. Eupompe Kinberg is also synonymous with Acoetes. Euarche Ehlers is a synonym of Eupanthalis McIntosh.

PANTHALIS Kinberg.

Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 386; McINTOSH, British annelids, 1900, **1**, pt. 2, p. 400.
Acoetes DARBOUX, Bull. sci. France & Belgique, 1900, **30**, p. 117 (in part).

PANTHALIS PANAMENSIS, sp. nov.

Plate **11**, fig. 4–8; Plate **2**, fig. 1–6.

The posterior end of the type is missing. The part present has sixty somites caudad of the peristomium. It is, exclusive of the protruded proboscis, 30 mm. long with a maximum width, over all, of 6 mm. The maximum width is about 6 mm. from the anterior end. From that level the body narrows cephalad and more slightly caudad.

The general color is a light brown with the parapodia yellowish; darker anteriorly but with no distinct markings at present detectable.

The prostomium is divided into two halves as usual; each half presents a distally much enlarged ommatophore, the half as a whole being clavately thickened proximad and distad from the narrow base of the ommatophore, but with the proximal region, or prostomial lobe proper, considerably the larger. Ommatophore and prostomium proper about equal in length. At its distal end each ommatophore bears a conspicuous eye. It is darkened two thirds the distance to its base. At the base of each ommatophore above there is a small but conspicuous, black, sessile eye. The median tentacle arises in the usual position between the prostomial lobes; it narrows slightly distad to a level below the apices of the ommatophores, where it narrows more abruptly to a slender tip which extends distally beyond the ommatophores. The lateral tentacles are similar in form and length. Each has a pigmented area proximally. The palpi are long and acuminate, in the present contracted condition in the type being two and a half to three times as long as the prostomium and ommatophores.

The ceratophores of the cirri of the peristomial parapodia are distally on a level with the narrowest region of the ommatophores where attached to the lobe bearing the sessile eye. The cirri have the same shape as the median tentacle and are of nearly the same length; each has a dark pigmented patch proximally. No setae were detected on the parapodia of the peristomium.

The elytra have the usual arrangement, occurring on II, IV, V, VII, etc. Anteriorly they meet and overlap along the median line, but elsewhere they leave the middorsum naked between the two rows. The elytra are thin, delicate and transparent. In outline they are very broadly elliptic or nearly circular. Each is weakly campanulate, being depressed somewhat in funnel-form at place of attachment and with the border showing a tendency to turn up over all or part of its circumference. The margin is free from cilia and the surface is smooth. (Plate **12**, fig. 5, 6).

The dorsal cirri are stout at base and strongly acuminate distad, subulate. They extend beyond the distal end of the parapodia but are clearly surpassed by the setae. The ventral cirri are small conical processes attached near or somewhat proximad of the middle of the ventral surface of the parapodium. Each is very short and does not reach the end of its parapodium. The parapodia are conspicuously flattened anteroposteriorly; very deep at base, being there about as deep as long, narrowing subconically distad; the rami very short and scarcely separated, blunt, of about equal extent.

Acicula two in each parapodium. Pale in color, darker distally than proximally. Stout at base, strongly acuminate distad but with tip not finely acute; with numerous longitudinal fibrillae and distally usually showing many cross striae. The middle setae are stout spines somewhat clavately enlarged and flattened. Distally they are a little curved and end in a short, acute point below which on one side is a series of fine teeth and on the opposite side a long, lash-like process which in most cases in the type has been broken off close to its base. Of the teeth there are ten to sixteen in each series. (Plate **12**, fig. 3, 4). The setae of the dorsal series vary much in thickness and length, some being exceedingly fine and capillary, others much coarser, though all are much more slender than those of the middle series. The principal ones much exceed in length those of the middle series. Each presents a long, slender shaft which has distally a lance-like or fusiform enlargement prolonged into a long, very slender, acute tip which is more or less curved. This tip is fringed along both sides, the hairs extending proximad farther on the convex side than on the concave, while distally the hairs increase in length and form a brush-like structure (bipinnate, penicillate). In some of the finer setae the hair-like processes of the tip are sparse and widely separated. (Plate **11**, fig. 7, 8). The setae of the ventral series are, as usual, much more slender than those of the middle series and are mostly also decidedly longer. Each toward the distal end has a fusiform enlargement at which there is an abrupt bend or crook. Above the enlargement is a long, slender, acutely-pointed tip. On each side of the head is a series of coarse scales which are well separated; above the enlargement these scales are succeeded by fine hairs which are very densely crowded. (Plate **12**, fig. 2). The setae of the first setigerous somite are conspicuously different from the forms above described. The dorsal setae are exceedingly fine, long, and finely pointed; the surface of these appears in part minutely obscurely roughened. The setae of the median series are slender and elongate; each is expanded into a narrow blade near the middle of its length and is distally drawn out into a long, slender, acuminate and curved tip, the seta as a whole also curving; on the convex side from the base of the expanded blade distad is a close series of processes giving the edge a finely serrate or pectinate appearance. (Plate **12**, fig. 1). The setae of the ventral series are of the same general form as those of the other parapodia; but scales occur only along one side and are uniform to the distal end excepting for reduction in size. They are smaller in size. The dorsal and ventral setae of the second setigerous somite are like those of the first; but those of the median series are conspicuously different, being of the general form described as typical above but lacking the subapical process or spur. (Plate **11**, fig. 5, 6).

The extended proboscis is strictly cylindrical. It is 6 mm. long and about 3.2 mm. in thickness. In the dorsal series of papillae at its distal end five on each side of the longer conically acuminate median one. The papillae of the ventral side are the same in number and arrangement. (Plate **11**, fig. 4). The maxillae are slender and long with the two upper ones not differing, or differing but little, in size from the inferior ones. In the type the superior maxillae each closes to the left of the corresponding ventral one.

The paratype is badly preserved. It is incomplete posteriorly. Exclusive of the proboscis it is 75 mm. long and consists of about ninety-two somites. The posterior half of the body is more strongly narrowed in comparison with the anterior.

Locality. Panama. Shore. 20 March, 1900. Two specimens.

This species belongs with those having two pairs of eyes, a sessile one in addition to the stalked pair, the latter alone being present in *P. oerstedi*, the typical species. It has resemblances to the Japanese *P. jagasimae* Izuka. From that species it differs, *e.g.*, in the form of the proboscis and in the smaller number and different form and proportions of its papillae, and especially in the detailed structure of the setae of the different series.

SIGALIONIDAE.

The body is most commonly long and narrow, cylindrical and vermiform, or, more rarely, short and somewhat flattened as is particularly the case in Eulepidinae.

The prostomium is rounded. The eyes may be four, two or none. When present all are sessile. The tentacles in number are three, two or only one. The palpi, always present, are long and attenuated distad, smooth throughout. The lateral tentacles in most genera are fused, excepting at their tips, with the first parapodia which are carried well forward.

Parapodia biramous. Notopodia bearing simple setae. The neuropodia may also bear only simple setae (Eulepidinae), but more commonly (Sigalioninae) bear composite setae either exclusively or mixed with simple setae.

Elytra borne on somites II, IV, V, VII and on the alternate succeeding somites caudad to the twenty third or, less commonly, to the twenty seventh, after which both cirri (cirriform branchiae) and elytra occur on all somites alike.

The proboscis ends in a marginal crown of papillae and is armed with four horny jaws.

The members of this family occur from the littoral region down to depths of several hundred fathoms. They often occur buried in mud or sand some centimeters below the surface.

Key to Genera.

a. All setae simple; body short and somewhat flattened.................. *Eulepethinae,* nom. nov.
b. Elytra on somites II, IV, V, VII etc.................................. *Eulepethus,* nom. nov.
bb. Elytra on somites II, III, IV, VI, VII etc.............................. *Pareulepis* Darboux.
aa. The setae in part composite; body usually long and slender, cylindrical, less commonly short. *Sigalioninae.*
b. With no median tentacle; lateral tentacles small, attached at anterior end of proboscis; branchiae well developed.. *Sigalion* Cuvier.
bb. A median tentacle present; branchiae well developed or not.
c. Tentacle one, the laterals absent.
d. Dorsal cirri or branchiae none; no setae on the first somite............ *Pholoe* Johnston.
dd. Branchiae present but rudimentary; setae on the first somite.......... *Eupholoe* McIntosh.
cc. Tentacles three; branchiae well developed.
d. Lateral tentacles free only at tips, fused proximally with parapodia of the first somite.
e. Median tentacle long bearing on its ceratophore a pair of prominent spatulate ctenidia; elytra completely covering the dorsum.
f. Composite setae falcigerous, distally sometimes flagelliform.

g. Terminal piece of composite setae, long, articulated........*Sthenelais* Kinberg.

gg. Terminal piece of composite setae very short, not articulated, apex entire. *Sthenelanella* Moore.

ff. Composite setae spinigerous..................................*Sthenolepis* Willey.

ee. Median tentacle without ctenidia; elytra not completely covering the dorsum, the latter naked at middle anteriorly.

f. Composite setae falcigerous; median tentacle typically attached at anterior margin of prostomium; elytra thick, with numerous papillae to which solidly adhere grains of sand or particles of shells, etc................................*Psammolyce* Kinberg.

ff. Composite setae spinigerous; median tentacle very short, inserted farther caudad directly on the prostomium; elytra thin and smooth, with no such adhesive papillae bearing foreign bodies......................................*Leanira* Kinberg.

dd. Lateral tentacles free, not fused to first parapodia; median tentacle small, inserted directly on prostomium above; composite setae falcigerous............*Euthalanessa* Darboux.

Synonymy of Genera.

Thalanessa as used by McIntosh, Haswell and various more recent writers is a quite different genus for which Darboux rightly proposes another name, Euthalanessa.

Eusthenelais McIntosh (1876) is regarded as synonymous with Sthenelais Kinberg, as I am able to find no generic differences. Conconia Schmarda is also equivalent to Sthenelais.

Eulepis Grube is preoccupied in Insecta (Dalman, 1820) and also in Reptilia (Fitzenger, 1843). It is here replaced by Eulepethus, nom. nov. and the name of the subfamily changed to Eulepethinae.

STHENOLEPIS Willey.

Ceylon pearl oyster fisheries report, 1905, pt. 4, p. 259.

STHENOLEPIS AREOLATA (McIntosh).

WILLEY, Ceylon pearl fisheries report, 1905, pt. 4, p. 259; MOORE, Proc. Acad. nat. sci. Philad., 1910, p. 391; IZUKA, Journ. Coll. sci. Imper. univ. Tokyo, 1912, **30**, p. 89, pl. 10, fig. 8.

Leanira areolata MCINTOSH, Challenger Annelida, 1885, p. 151, pl. 21, fig. 3, pl. 25, fig. 8, 9, pl. 13A, fig. 1; MOORE, Proc. Acad. nat. sci. Philad., 1903, p. 426.

LOCALITY. Off E. point Santa Rosa Island, Cal.: Sta. 4571 (lat. 33° 40′ N., long. 119° 35′ W.). Depth between 20 and 900 fathoms, a special sounding not taken. Character of bottom and bottom temp. not ascertained. 7 October, 1904. One incomplete specimen.

The species was dredged by the ALBATROSS earlier in the same year at several points near Monterey Bay and off the southern coast of California at depths from 66 to 971 fathoms. (*Cf.* Moore, Proc. Acad. nat. sci. Philad., 1910, p. 391).

Sigalion Cuvier.

Règne Animal, ed. 2, 1829, **3**, p. 207; Audouin & Milne Edwards, Ann. sci. nat., 1832, ser. 1, **27**, p. 398; Hist. nat. litt. France. Annélides, 1834, **2**, p. 103; Kinberg, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 387; Darboux, Bull. sci. France & Belgique, 1900, **30**, p. 115; McIntosh, British annelids, 1900, pt. 2, p. 427.

Thalanessa Baird, Journ. Linn. soc. London. Zool., 1865, **8**, p. 32.

Sigalion pourtalesi Ehlers.

Mem. M. C. Z., 1887, **15**, p. 57.

Locality. Gulf of Mexico: Sta. 2370 (lat. 29° 18′ 15″ N., long. 85° 32′ W). Depth 25 fathoms. Bottom of coarse grey sand and broken shell. 7 February, 1885. One specimen.

Polylepididae.

Of the five families of truly elytra-bearing polychaetes which are here made to compose a superfamily Aphroditoidea, one (Polylepididae) is not represented in the collection of the Albatross. This is a small family embracing but two genera, each represented by a single imperfectly known species. They approach the Sigalionidae in having composite setae but are distinguished particularly in bearing elytra on all the somites. The prostomium bears a single tentacle and a pair of palpi. The proboscis is armed with four horny jaws. The two genera, as known from the original accounts, may be easily separated as follows.

Key to Genera.

a. With suctorial processes on dorsal and ventral surface of the parapodia; setae all composite. *Pelogenia* Schmarda.

aa. With no such suctorial feet; notopodial setae simple, the neuropodials composite. *Polylepis* Grube.

Synonymy of Genera.

The second genus was designated Lepidopleurus by Claparède (Annélides Chétop. Golfe Naples, 1868, p. 105); but as this name was previously used for a mollusc, Polylepis, adopted by Grube (Annulata Semperiana, 1878, p. 16) from Claparède's name for the family, may be used. Grube, however, from a study of a specimen in Claparède's collection which he believes to be that author's Lepidopleurus, doubts that this genus is in reality a member of this group as he found an alternation of elytra and cirri in the specimen (see Jahresber.

Schlesch. gesellsch., 1876, **53**, p. 72). If a valid genus it would in such case probably belong in the Sigalionidae. The name of the present family would accordingly have to be changed to Pelogeniidae.

PALMYRIDAE.

Probably near the Aphroditoidea are to be placed the two families Palmyridae and Chrysopetalidae, neither of which is represented in the present collection. Their genera as at present known may be separated by means of the following keys.

Key to Genera.

a. Notocirri on somites I, II, III, IV, V and then on alternate somites to the end of body; basal portion of paleae short and straight; borders of palae smooth and rounded. .*Palmyropsis* Potts.
aa. Notocirri on somites I, II (?), III, VI, and thereafter on alternate somites to near end of body; basal portion of paleae long; borders serrate........................*Palmyra* Savigny.

The annelid listed by McIntosh in the CHALLENGER report as *Palmyra aurifera* Savigny and on which he found small elytra, is not that species but apparently is a true aphroditid near Pontogenia.

CHRYSOPETALIDAE.

Key to Genera.

a. Body short, somites few.
  b. Paleae covering the dorsum in large part.
    c. Some of the paleae broad, others narrow..........................*Paleanotus* Schmarda.
    cc. Paleae equal..*Chrysopetalum* Ehlers.
  bb. Paleae narrow, leaving most of the dorsum bare......................*Dysponetus* Levinsen.
aa. Body elongate, somites numerous..*Bhawania* Schmarda.

Heteropale Johnson is a synonym of Paleanotus Schmarda.

NEPTHYDIDAE.

The body is elongate and composed of numerous somites. In cross-section somewhat tetragonal but with the dorsum convex and the venter typically flattened. Usually pale, pearl-gray with iridescence, only rarely well pigmented. Varying in size from one or two centimeters to twenty-five centimeters. Somites mostly less than one hundred and fifty.

The prostomium is flattened and commonly subrhomboidal in outline as seen from above, less commonly quadrangular or hexagonal. Normally there are four tentacles, two borne on the anterior margin on each side, or in rare cases, only two tentacles are present. Eyes two in number and small, or absent.

Peristomial somite normally fused with the second one.

Parapodia biramous, the branches widely separated from each other and each provided with a special membranous lobe or lamella more or less strongly developed; and in connection with it often other processes. In addition the notopodium bears a small notocirrus and a branchia, and the neuropodium bears a neurocirrus and may or may not bear also a branchia.

Each branch of the parapodia bears a stout aciculum. The setae are all simple, or rarely composite setae may occur in the neuropodia. The setae are mostly strongly cross-striate or camerated, while some are serrated and some have lyriform tips.

Anal cirri usually one, rarely two.

Proboscis showing two regions; with or without two short horny jaws; a double row of bifid papillae around the aperture and with or rarely without papillae in longitudinal series (14–22).

The members of this family are vigorous animals with a strong muscular development. They live most abundantly in or near the littoral region though they areoccasionally taken from considerable depths (*e.g. Nepthys phyllobranchia* McIntosh from 1,240 fathoms). They frequent sandy bottoms or sand more or less mixed with slime or mud in which they bury themselves with surprising rapidity, using the proboscis in forming the burrow (*Cf.* Gravier, Nouv. arch. Mus. hist. nat., 1901, ser. 4, 3, p. 126). In their alimentary tracts Gravier found such forms as diatoms, radiolarians, sponges, Foraminifera, and the remains of other polychaetes which their characteristically strong general musculature and their powerful probosces enable them to overcome.

The family is remarkably homogeneous, only a single genus being recognized by most authors though various other groups have been proposed as indicated by the synonomy given below under Nepthys.

NEPTHYS Cuvier.

Règne Anim., 1817, **13**, p. 203; SAVIGNY, Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, AUDOUIN & MILNE EDWARDS, Hist. nat. litt. France. Annélides, 1834, **2**, p. 232.
Diplobranchus QUATREFAGES, Hist. nat. annelés, 1865, **1**, p. 433.
Portelia QUATREFAGES, *Op. cit.*, 1865, **1**, p. 431.
Aglaophamus KINBERG, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 239.
Aglaopheme KINBERG, *Ibid.*, p. 240.

NEPTHYS ECTOPA, sp. nov.[1]

Plate **15**, fig. 1–7.

The general color is light brown without distinct markings excepting a short median longitudinal dark line extending caudad on the dorsum from the caudal angle of the prostomium, and a dark band in the median ventral furrow which at the anterior end is Y-shaped.

The type, which lacks the posterior region, is composed of forty-eight somites. It has a total length, exclusive of the proboscis, of near 27 mm. and a maximum width of 3 mm. The body is clearly widest at the anterior end (at the 5th or 6th somite), narrows strongly to about the twelfth somite, and then more gradually caudad.

The prostomium is in the form of a broadly subtriangular plate with base cephalad, the apex of which extends back to the fourth somite and thus divides above the first three somites. The anterior margin is straight or very slightly concave between the widely separated lateral corners which bend back obliquely caudad. The anterior border slopes ventrocephalad. Surface in general smooth and shining. Close to each lateral margin and about midway of the length is a convex elevation, subelliptic in outline, which apparently represents an eye though wholly without dark pigment at present. On the anterior margin are two pairs of short, colorless and conical processes or tentacles; on each side there is one on the oblique line of the corner and one at the end of the straight median region close to the first one, the two on each side being thus widely separated from the two on the other. (Plate **15**, fig. 1).

What is interpreted as the peristomium appears on the ventral side as a straightly margined, narrow band weakly divided by a transverse furrow; it extends up each side and disappears beneath the border of the first setigerous somite before reaching the prostomium, which thus appears to be wholly free from it. It bears no cirri.

The first two setigerous somites are evident only dorsally on each side of the prostomium. On each side these somites lie between the prostomium and the third setigerous somite, against which these outer ends lie. Each bears only a fully developed notopodium, the neuropodium being wholly absent. The fourth somite (third setigerous) extends farther ventrad than the two preceding but is likewise incomplete beneath, while above it is partly separated

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[1] ἔκτοπος, strange.

by the prostomium, the apex of which extends into it. It bears both notopodia and neuropodia. The succeeding somites are all complete and simple. They are separated above and laterally by deep intersegmental furrows; ventrally between the base of the neuropodia on each side and the prominent neural furrow, the intersegmental furrows are rather faint, becoming again more pronounced in this furrow. The ventral furrow widens out clavately toward the anterior end in the wider region of the body, the elevated part of the venter on each side curving ectad and dorsad. The furrow between the peristomium and the succeeding part of the venter is very deep, in strong contrast with the following intersegmental furrows which are weak.

With the exception of the first two pairs, the parapodia are biramous. In each of the first two pairs the parapodium is represented by the notopodium alone, this having the essential form of those in the typical parapodia succeeding. Each is low, subconical, but with a broad top and bears a pointed, conical, somewhat flattened appendage on its ventral side at base. The parapodia (notopodia) of these first two pairs are situated much farther dorsad than the others, lying up close to the prostomium. The notopodium of each one of the third pair of parapodia is abruptly farther ventrad and about halfway from the second to the level of the fourth; from the fourth, the notopodia become gradually located farther and farther ventrad to about the tenth somite, after which the same level is maintained. In a typical parapodium the two branches are widely separated. (Plate 15, fig. 3). The notopodium is short and thick, with the distal end convex, oblique to the main axis, and bearing along its circumferential line the numerous setae excepting for a short open space or break on the dorsal side, while the top of the aciculum touches the surface near the centre of this area and shows conspicuously in a small dark elevation; from the ventral side of the notopodium a conspicuous branchial lobe projects ventrad reaching the neuropodium; this lobe is thick at base but conspicuously flattened distally in the anteriocaudal direction and is also expanded distally, the distal end subtruncate with a tendency to be weakly bilobate from a small notch at middle, while slight crenulations may also show along the ventral edge. In the anterior region in going cephalad this lobe becomes smaller and smaller, at the same time becoming more pointed distad until of the conical form above mentioned on the most anterior ones. No notocirri are present in the type. The neuropodium of a typical parapodium of the middle region of the body is also short and thick with the upper side straight, the ventral more slanting; the distal surface is broad and convex and slopes obliquely ventromesad;

it is encircled by setae, as in the case of the notopodium, excepting for a break on the ventral side, while the aciculum is situated at the centre; the neuropodium bears near its base on the ventral side a short, subcylindric, distally acuminate cirrus.

In each notopodium and neuropodium there is a single stout, dark reddish aciculum occupying a central position with its acute tip extending into a slight conical elevation at the surface. The aciculum is obviously longitudinally fibrillate and may show a cross-striation or cross-wrinkling, particularly in the distal region as shown in the figure. (Plate 15, fig. 7). The setae are arranged on each notopodium and neuropodium in a line that has the form of an elongate ellipse which is commonly narrowly broken at the dorsal end in the notopodia and at the ventral in the neuropodia. The setae are all simple and none of the crochet-type occur. The setae on the anterior side in each case are much finer than the others and are very flexible; each ends in a fine acute tip below which it is covered until toward the base by numerous, closely arranged, transverse, toothed ridges or pectinae. (Plate 15, fig. 4). The principal setae are much coarser; each from a stout base narrows continuously distad, the tip being fine, acute, and smooth, while proximad of the tip the seta along one edge is closely set with very fine teeth or hairs. These setae appear on the average to be coarser in the neuropodium than in the notopodium. (Plate 15, fig. 5, 6). They are densely fibrillate and through wear often are much frayed distally, the breaks occurring naturally in the direction of the fibrillae which may at the end become separated like hairs and give a brush-like appearance. No specially modified setae on particular parapodia were detected, though the much rubbed condition of some prevented complete study.

The proboscis is fully protruded in the type. It has a length of 3 mm. and a maximum diameter equal to this. Just within the distal margin and about the opening is a closely arranged series of long papillae each of which is distally bifid with each lobe conical, the two lobes in each case lying in the same vertical or radial plane; the papillae at each side are shorter than the dorsal and ventral ones. Along the distal margin and immediately proximad of it are arranged five encircling series of slenderly conical, well-separated papillae; these decrease in length from those of the most distal to those of the most ventral series which are very small. In the type the papillae form twenty-one radial series. The remaining median and proximal region of the proboscis is wholly smooth. (Plate 15, fig. 2).

Locality. Off Aguja Point, Peru, 20 m. N. W.: Sta. 4654 (lat. 5° 46′ S., long. 81° 31′ 9″ W.). Depth 1,036 fathoms. Bottom dark brown mud. Bottom temp. 37.3° F. 12 November, 1904. One specimen.

NEPTHYS sp.

A fragment of a specimen belonging to this genus was dredged from a depth of 39 fathoms off the Coast of Mexico (Sta. 3418). Expedition, 1891. It lacks both ends.

PHYLLODOCIDAE.

A large family in which the body, while usually more or less elongate and vermiform and either cylindrical or depressed, varies enormously in size, with the number of somites from comparatively few (*e. g.* twenty-three) to eight hundred or more.

The prostomium is of various forms, bluntly subconical to suboval. With four tentacles and often in addition with an unpaired median tentacle normally posterior in position. Palpi none. Eyes two or four, usually small but larger in the epitokous forms, rarely absent (Paralacydonia).

Tentacular cirri from one to four pairs (or possibly five in Kinbergia) borne on from the first one to the first three somites, or none (Paralacydonia).

Nuchal organ from strongly developed to none.

Nephridia with inner end always closed, in connection with numerous solenocytes. The genital funnel distinct though often at maturity opening into the nephridial canal. Aside from the phyllodocoids, the Glyceridae and the Nepthydidae alone present these conditions (see Goodrich, The nephridia of the Polycheta, Quart. journ. micros. sci., 1900, **43**, p. 699).

The parapodia in most cases uniramous with a single aciculum and one fascicle of setae; in other cases biramous and with two acicula. Certain forms in the epitokous phase acquiring natatory simple setae as in the syllids. Neurocirri and notocirri flattened, thin and foliaceous, and all containing strongly developed mucus-glands. The cirri in the aberrant Paralacydonia, however, vary from this normal type.

Setae in most cases composite, but sometimes in part simple and very rarely (Nans) all simple. Certain epitokous forms acquiring special, simple, long, natatory setae.

Pygidium with two anal cirri which are either subulate or foliaceous.

Proboscis commonly powerful, bipartite, and smooth, or bearing variously arranged papillae, rarely with small chitinous pieces but never with true jaws.

The phyllodocids proper are mostly essentially littoral animals occurring in and near the tidal zone under stones, on the mussel beds, on rock or in fissures in the same, in the laminarian region and similar places. In some regions they are particularly abundant at moderate depths of from eight to twelve fathoms on bottoms covered by shells bored or disintegrated by Clione, (see Gravier, Recherches sur les phyllodociens, Bull. scient., 1896, **29**, p. 305). The CHALLENGER secured a specimen from the considerable depth of five hundred fathoms which McIntosh identifies as *Genetyllis oculata.* The phyllodocids are very active, not only moving about freely over solid surfaces but also swimming with ease and grace, an activity in which the expanded foliaceous cirri play an important rôle.

Some forms, too, are normally pelagic, such as particularly the species of Pelagobia, Lopadorrhynchus, Prolopadorhynchus, Pedinosoma, Maupasia, and Haliplanes and also the two new genera Nans and Mastigethus. These forms are included by Reibisch (Die pelag. phyllodociden u. typhloscoleciden, Ergebn. Atlant. Ocean * * * Plankton exped., **2**, N. c., p. 18) in Claparède's subfamily group Lopadorhynchidae (properly Lopadorrhynchinae) against which he places a subfamily Phyllodocidae (Phyllodocinae) *sens. str.*, which groups at present seem artificial. The pelagic genera mentioned embrace species colorless and transparent and for the most part small, most not exceeding 10 mm. in length, though some may rarely reach 40 mm. Most are less than 5 mm. long. Unlike the pelagic alciopids these forms do not show a special increase in the size of the eyes, these being, on the contrary, reduced or absent; but in possible compensation the tentacular cirri are often especially strongly developed. The setae for the most part are exceptionally fine and long. The epitokous forms of certain species of which the atokous forms are littoral are pelagic and show corresponding adaptive modifications. The females of these pelagic epitokous forms approach the shore to lay their eggs, these being deposited on Algae, stones, etc.

The pelagic forms are ordinarily colorless, while the littoral forms are among the most brilliantly and variously colored of annelids; and it is noteworthy that the colors of those from deeper waters are of the same character.

The phyllodocids are boldly carnivorous. Gravier (*op. cit.*, 1896, p. 306) notes having found in their alimentary tracts the setae and other debris of various other annelids, including terebellids, spionids, sabellariids, syllids, and others, in addition to those of their own kind, which they attack and rend by means of their probosces. He found in the digestive tube of *Eulalia viridis* (Linné) another individual of the same species almost intact; and St. Joseph made a similar observation in the case of *Eulalia pallida* Claparède. They often attack forms larger than themselves. Rarely vegetable fragments, as of Fucus, and diatoms are found in their alimentary tracts.

Gregarines occur frequently in the alimentary tract of phyllodocids. A number of external parasites have been noted by St. Joseph and others, *e. g.* colonies of Vorticella on *Anaitides mucosa* (Oersted), the orthonectid *Rhopalura pterocirri* on *Sige* (*Pterocirrus* Claparède) *macroceros*, a crustacean, *Herpyllobius articus*, on *Eulalia pallida*, etc.

In this work the groupings and general system elaborated by Bergström in his recent revision (Zur systematik der polychaetenfamilie der phyllodociden, Zool. bidrag, 1914, **3**, p. 37) have been in general adopted.

Key to the Subfamilies and Genera.

a. No composite setae present..*Natinae*, subfam. nov.
Setae of two distinct types; two pairs of tentacular cirri both belonging to the first somite; notocirri of first ordinary somite strongly developed...................*Nans*, gen. nov.
aa. Composite setae present.
b. Eyes present; notocirri of the normal foliaceous type; tentacular cirri present.
c. Notocirrus of first normal somite reduced; tentacular cirri either two pairs, both on the first somite, or three pairs with one on the first and two on the second somite........*Eteoninae.*
d. With three pairs of tentacular cirri; ventral tentacular cirri of second somite foliaceous. *Pseudomystides* Bergström.
dd. With but two pairs of tentacular cirri; all tentacular cirri filiform.
e. The peristomium bearing distinct setigerous parapodia; pelagic forms....*Pelagobia* Greef.
ee. Peristomium without setae or parapodial processes proper; non-pelagic or creeping forms.
f. First normal somite with setigerous parapodia.
g. Proboscis distally with two lateral rows of true papillae and also bearing chitinous denticles...*Mysta* Malmgren.
gg. Proboscis smooth with neither true papillae nor denticles.......*Eteone* Savigny.
ff. First normal somite only with ventral cirri, parapodia proper and setae wholly lacking. *Hypereteone* Bergström.
cc. Notocirrus of first normal somite fully developed.
d. With only two pairs of tentacular cirri, one on the first and one on the second somite which latter bears also an ordinary ventral cirrus..............................*Lugiinae.*
Lugia Quatrefages.
dd. With more than two pairs of tentacular cirri, or rarely with but two pairs, in which case the second somite bears no neurocirrus.
e. Three pairs of tentacular cirri or but two, of which only one pair occurs on somite I.
f. Tentacular cirri occurring on but two somites and either three pairs with the two pairs on the second somite, or else but two pairs with ventral cirri of second somite absent or rudimentary...*Mystidinae.*
g. With three pairs of tentacular cirri, fully developed, two pairs pertaining to the second somite; prostomium free....................................*Mystides* Théel.
gg. With only two pairs of developed tentacular cirri, or a rudimentary third pair may be present (ventrals).
h. All setae composite; prostomium fused with the first somite. *Pedinosoma* Reibisisch.
hh. Simple as well as composite setae present.
i. Prostomium fused only with the first somite.

j. Neurocirri present on the anterior somites bearing only simple setae. *Prolopadorhynchus* Bergström.

jj. Neurocirri not present on these somites.

k. Proboscis without papillae; without prominent nuchal processes. *Lopadorrhynchus* Grube.

kk. Proboscis on each side with a long, finger-like papilla; on each side of prostomium a large branched nuchal process prominently extended. *Mastigethus*, gen. nov.

ii. Prostomium fused with the first normal somite as well as with the preceding; neurocirri on all somites............................*Reibischia* Bergström.

dd. Tentacular cirri occurring on three somites, one pair on each........*Protomystidinae.* *Protomystides* Czerniavsky.

ee. Either four pairs of tentacular cirri or but three, in the latter case two pairs on the first somite..*Phyllodocinae.*

f. With four pairs of tentacular cirri.

g. All somites bearing tentacular cirri wholly free.

h. All parapodia with two acicula.

i. All somites bearing tentacular cirri fully developed....*Austrophyllum* Bergström.

ii. First somite dorsally reduced.

j. Ventral cirrus of second segment foliaceous and asymmetrical. *Hesperophyllum* Chamberlin.

jj. Ventral cirrus not foliaceous and asymmetrical........*Notophyllum* Oersted.

hh. All normal parapodia with a single aciculum.

i. All somites bearing tentacular cirri fully developed; a median tentacle present.

j. All tentacular cirri filiform or fusiform; proboscis distally diffusely papillose. *Eulalia* Savigny.

jj. Tentacular cirri not all filiform or fusiform, ventrals of II modified.

k. Ventral tentacular cirri of second somite thick, asymmetrical, the others filiform or fusiform; proboscis smooth..............*Notalia* Bergström.

kk. Ventral tentacular cirri of second somite thin, foliaceous, asymmetrical; the entire proboscis diffusely papillose.................*Steggoa* Bergström.

ii. First tentaculo-cirriferous somite dorsally reduced.

j. An unpaired tentacle present.

k. Proboscis smooth; all tentacular cirri filiform or fusiform. - *Eumida* Malmgren.

kk. The entire proboscis papillose.

l. Tentacular cirri filiform or fusiform................*Pirakia* Bergström.

ll. The ventral tentacular cirri of somite II thin and foliaceous, asymmetrical. *Sige* Malmgren.

jj. No unpaired tentacle but with a nuchal papilla.

k. All tentacular cirri filiform or fusiform.

l. Proboscis proximally with papillae in series......*Anaitides* Czerniawsky.

ll. Proboscis proximally with papillae diffuse..........*Phyllodoce* Savigny.

kk. Only the dorsal tentacular cirri of second somite filiform, the others short, thick, and almost globular....................*Sphaerodoce* Bergström[1].

gg. Not all somites bearing tentacular cirri free.

h. Prostomium free, but the first two somites fused with each other.

i. The tentaculo-cirriferous somites fully developed, forming dorsally a collar-like swelling; proboscis with two lateral rows of large papillae..*Paranaitis* Southern.

ii. Tentaculo cirriferous somites dorsally strongly reduced; proboscis diffusely papillose.

j. All tentacular cirri flask-shaped......................*Genetyllis* Malmgren.

jj. Tentacular cirri of I and the ventrals of II filiform, the others flattened, foliaceous......................................*Nereiphylla* Blainville.

hh. Prostomium fused with one or more of the succeeding somites.

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[1] Bergström (*op. cit.*, 1914, p. 87) first mentions this genus with its type-species (*Phyllodoce quadraticeps*) under the name Globidoce; but on subsequent pages, and in the diagnoses, Sphaerodoce is used. The occurrence of Globidoce in the text was undoubtedly an oversight.

i. Prostomium fused with the first somite only..........*Hypoeulalia* Bergström.

ii. Prostomium fused with two or all three of the somites bearing tentacular cirri.

j. Prostomium fused with the first two somites......*Prochaetoparia* Bergström.

jj. Prostomium fused with all three somites bearing tentacular cirri, the resulting part bearing simple setae........................*Chaetoparia* Malmgren.

ff. With three pairs of tentacular cirri.

g. Somites bearing tentacular cirri wholly free..................*Haliplanes* Reibisch.

gg. First somite completely fused with the prostomium............*Maupasia* Viguier.

bb. Eyes none; tentacular cirri none; notocirri small, not truly foliaceous.
Paralacydoniinae subfam. nov.
Paralacydonia Fauvel.

Synonymy of Genera.

Eracia Grube is a synonym of Eulalea Savigny.

Porroa Quatrefages is a synonym of Eteone Savigny, as is also Eteonella McIntosh.

Pterocirrus Claparède is identical with Sige Grube, both having the same species as the type, *Pterocirrus macroceros* = *Sige fusigera*, *macroceros* being the older.

Mesomystides Czerniavsky is a synonym of Mystides Théel.

Trachelophyllum Levinsen has been withdrawn into Notophyllum Oersted, its type, *T. lütkeni* Levinsen being the same species as the type of Notophyllum, *N. foliosum* (M. Sars).

Macrophyllum Schmarda is very probably a synonym of Notophyllum Oersted, but as the type of the typical species (*M. splendens*) no longer exists, and the species is known only from the original account, the position of the genus is somewhat doubtful.

The same is true of Myriacyclum Grube, based upon *Notophyllum myriacyclum* Schmarda. Until this species is again found it will probably be impossible correctly to place it.

The types of the two species included by Quatrefages in his genus Kinbergia are also lost and the species (*Phyllodoce macropthalma* Grube and *P. longicirris* Grube) have not been identified recently. Five pairs of tentacular cirri are ascribed to members of this genus; but Bergström's suggestion that Grube enumerated as the first of these nuchal organs unusually strongly extruded seems plausible.

Eunomia Risso (1826), regarded by its author as near Phyllodoce, is doubtful even as to family. No types of its two species (*E. tympana* and *E. viridissima*) exist. The genus should probably be discarded.

Nothis Pruvot (1885) is similarly unrecognizable.

Protocarobia and Paracarobia were established by Czerniawsky (1882) as subgenera of Carobia to which he gives an individual definition and scope, with *Phyllodoce tenuissima* Grube and *Anaitis lineata* Claparède as the types. The first of these species is synonymous with *Phyllodice macrolepidota* Schmarda, and Protocarobia is here accordingly regarded as a synonym of Phyllodoce. The position of Paracarobia must remain somewhat doubtful until *A. lineata* has been restudied.

Eulalides Czerniawsky has as its type *Eulalia saxicola* Quatrefages, a probable synonym of *E. bilineata* Johnston, the genotype of Hypoeulalia. In this case Eulalides must take precedence over Hypoeulalia.

Czerniawsky's genera Mesoeulalia (type, *E. incompleta* Quatrefages, from Torres Strait) and Paraeulalia (type, *Phyllodoce* (*Eulalia*) *multicirrus* Grube, from the Philippines) require a restudy of the type-species before they can be properly placed or estimated.

The type of the same author's Pseudonotophyllum is *Notophyllum polynoides* Oersted, which is a synonym of *Phyllodoce foliosa* Sars, the type of Notophyllum. Pseudonotophyllum is thus completely and permanently in synonymy. That author's Eunotophyllum, with *Notophyllum alatum* Langerhans as type, is probably also to be merged with the same genus.

Anaitis Malmgren (1865) was preceded by Anaitis Desponchel (Lepidoptera, 1844). Hence Paranaitis was supplied by Southern in 1914.

ANAITIDES Czerniawsky.

Bull. Soc. imper. nat. Moscou, 1882, **57**, p. 158; BERGSTRÖM, Zool. bidrag., 1914, **3**, p. 108, 118, 138.

The better known species of this genus may be separated as follows.

Key to Species.

a. Proboscis normally with a median dorsal row of five papillae in addition to twelve lateral of nine or ten papillae each; styles of neurocirri of middle region narrow, drawn out to a point distally. *A. patagonica* Kinberg.

aa. With no median dorsal row of papillae on the proboscis.

  b. With eight lateral rows of papillae on the proboscis; the dorsal cirri of the first three normal somites as wide as long.. *A. citrina* (Malmgren).

  bb. With twelve lateral rows of papillae on the proboscis; the dorsal cirri of the first three normal somites longer than wide.

    c. Proboscis with not more than twelve papillae in each of the middle lateral rows.

      d. Proboscis with nine or ten papillae in each lateral row.

        e. Ventral cirri of middle region of body with styles drawn out into a narrowly acute tip; dorsal cirri of this region with lamellae subquadrate.

          f. Third normal notocirrus broadly elliptic; three first pairs of normal notocirri much smaller than the succeeding ones...................... *A. heterocirrus* Chamberlin.

ff. Third normal notocirrus strongly narrowed distad, ovate; first three pairs of notocirri not abruptly much smaller.................................*A. mucosa* (Oersted).

ee. Ventral cirri of middle region of body with apex of styles not acutely prolonged, short and rather obtuse; styles of dorsal cirri not subquadrate.

f. Prostomium narrowed conically and subacutely forward, only moderately incised behind, as wide as or wider than long..........................*A. lamellifera* (Pallas).

ff. Prostomium broadly rounded in front, not conically narrowed, and at least a little longer than wide, very deeply incised behind..............*A. sancti josephi* (Gravier).

dd. Proboscis with at most seven or eight papillae in each middle lateral row.

e. Styles of neurocirri of middle region of body distinctly pointed; styles of notocirri of same region drawn out to a point, not quadrate....................*A. oculata* (Ehlers).

ee. Styles of neurocirri of middle region of body short and broad, distally blunt; dorsal cirri of this region quadrate, not distally prolonged................*A. maculata* (Linné).

cc. Proboscis with twelve or more papillae in each middle lateral row.

d. Twelve or thirteen papillae in each middle lateral row; styles of neurocirri of middle region surpassing the neuropodia, and the free part of setae exceeding the latter in length.
A. groenlandica (Oersted).

dd. Number of papillae in each middle lateral row at least eighteen; styles of neurocirri of middle region not attaining end of neuropodia, and the latter always longer than the free part of setae...*A. compsa*, sp. nov.

ANAITIDES LAMELLIFERA (Pallas).

Nereis lamellifera PALLAS, Nova acta Petrop., 1788, **2**, p. 232, pl. 5, fig. 11–17.

Nereis lamelligera GMELIN, Syst. nat. ed. 13, 1791, **1**, p. 6, 3128.

Phyllodoce lamelligera JOHNSTON, Ann. nat. hist., 1840, ser. 1, **4**, p. 225, pl. 6, fig. 1–6 (in part); EHLERS, Borstenwürmer, 1864, p. 139; JOHNSTON, Cat. annelids Brit. mus., 1865, p. 175; FISCHLI, Abh. Senck. naturf. gesellsch. Frankfurt-a-M., 1900, **25**, p. 120; MCINTOSH, British annelids, 1908, **2**, pt. 1, p. 76 (in part); IZUKA, Journ. Coll. sci. Imper. univ. Tokyo, 1912, **30**, p. 195 (in part); FAUVEL, Résult. campag. sci. Prince Monaco, 1914, **46**, p. 111.

LOCALITY. Panama: Perico Island. Shore. Exped. 1904–05. One specimen.

The single specimen referred to this species is very small, only about 20 mm. long exclusive of the protruded proboscis. It seems to have been broken and is regenerating posteriorly; the regenerating piece is sharply set off from the preceding portion. The number of somites remaining in front of the regenerating region is nearly sixty-eight. The color is light brown, lacking the conspicuous coloration and markings present in typical large specimens as appears to be the usual condition in dwarf specimens. The rows of papillae at the base of the proboscis are six on each side as usual; these show a tendency to be irregular and are not in all cases distinctly separated from each other. There are at the apex of the proboscis eighteen large papillae encircling the opening. The cirri are as usual or very nearly so.

It is evident that two or more distinct species have been confused by various writers under the name *lamelligera*, some of the specimens listed under it being true members of Phyllodoce in the restricted sense, while others are clearly members of Anaitides. The figures given by Pallas show that his species was, in part at least, a true Anaitides. *Phyllodoce laminosa* Savigny, is not an Anaitides. McIntosh erroneously makes this a synonym of the *lamellifera* of Pallas, the *lamelligera* of Gmelin. In the Pacific *A. lamellifera* proper has previously been recorded from the Moluccas (Fischli, *supra*) and from Japan (Izuka).

ANAITIDES PATAGONICA (Kinberg).

Carobia patagonica KINBERG, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 242.

Phyllodoce (Anatis?) *sanctae vicentis* McINTOSH, Challenger Annelida, 1885, p. 166, pl. 27, fig. 9, pl. 32, fig. 8, pl. 14A, fig. 14, 15; TREADWELL, Bull. U. S. fish comm., 1906, 1903, **23**, pt. 3, p. 1158.

Phyllodoce (*Anaitis*) *madeiriensis* LANGERHANS, Zeitschr. wiss. zool., 1880, **33**, p. 307, pl. 17, fig. 44a, 44b; EHLERS, Nach. K. gesellsch. wiss. Göttingen. Math. phys. klasse, 1897, p. 25.

Phyllodoce madeiriensis EHLERS, Abhandl. K. gesellsch. wiss. Göttingen. Math. phys. klasse, 1901, p. 72. WILLEY, Rept. voyage Southern Cross. Polychaeta, 1902, p. 270; EHLERS, Deutsche Südpolar exped., 1913, **13**. Zool., **5**, p. 453; FAUVEL, Résult. campag. sci. Prince Monaco, 1914, **46**, p. 111, pl. 6, fig. 5–13.

Anaitides patagonica BERGSTRÖM, Zool. bidrag, 1914, **3**, p. 147.

LOCALITY. Off Peru: Sta. 4653 (lat. 5° 47′ S., long. 81° 24′ W.). Depth 536 fms. Bottom dark brown volcanic mud. Bottom temp. 41.3° F. 12 November, 1904. One incomplete specimen.

The fragment consists of the anterior end. Exclusive of the fully protruded proboscis it is about eight millimeters long with a width, exclusive of the parapodia, of 1.2 mm. and over all of 3.5 mm. The extruded proboscis is 3.8 mm. long. There are forty somites present.

Bergström (*loc. cit.*) states that he has found only sixteen or eighteen papillae in the crown about the opening of the proboscis; but in the present specimen the number is seventeen, the same as given by Ehlers (*op. cit.*, 1897, p. 28) for his South Georgian specimens. Treadwell gives sixteen for his Hawaiian specimens. Bergström finds only five papillae in the middorsal series and never more than nine or ten in each lateral series, and considers higher counts than this due to confusion between series resulting from contraction in preservation. The present specimen, however, fully substantiates Willey who found larger numbers. In the middorsal series there are nine papillae of which the two most proximal and the one most distal are smaller. In the lateral rows the number varies from ten to twelve. The tentacles do not show the proximal annulation mentioned by Langerhans and Ehlers, this being due, most likely, to preservation. It is possible that the species is here too broadly conceived; but in the evidence available I find no good grounds for a division. This appears to be the second record, of the species from the Pacific Ocean, the other locality being off the Hawaiian Islands. It was previously recorded also from the Madeiras, from Patagonia, Juan Fernandez, Falkland Islands, Victoria Land and other far southern points.

ANAITIDES COMPSA, sp. nov.[1]

Plate **15**, fig. 8, 9; Plate **16**, fig. 1–6.

This is a large and showy species. Inclusive of the parapodia it appears broad, though the body proper is rather slender. It increases in width to about the eightieth somite after which it narrows gradually and continuously to the caudal end. The total length of the type is 175 mm. The greatest width, exclusive of the parapodia, is 4.2 mm., and inclusive of parapodia, 10.4 mm. The number of somites is nearly three hundred and forty-five.

The prostomium is decidedly flattened dorsoventrally in front and thickens caudad. In outline it is broadly subcordate, wider than long, with the greatest width to the length about as 32:27. Laterally and anteriorly widely rounded, in front projecting a little beyond the tentacles or in some nearly on a level with these. A distinct transverse sulcus between the eyes. Eyes small, circular, situated at one third the length of the prostomium from its caudal border, each being about one fourth the width of the prostomium from the lateral edge and thus about one half the width apart. The tentacles are short, stout, and conical, the dorsal ones about one fourth the greatest width of the prostomium and the ventral ones a little longer. At each side the tentacles proximally are almost contiguous and project ectad or a little cephalad of ectad. The tentacles of each side are widely separated from those of the opposite one.

The first three somites are free from the prostomium and from each other, the first incomplete dorsally. The tentacular cirri of the first somite reaching to the seventh somite. The dorsal tentacular cirri of the second somite reaching to the fifteenth somite and the ventrals to the seventh. The tentacular cirri of the third, or first setigerous, somite reaching to somite XIV.

The somites in general are very short and closely crowded, in the widest region of the body of the type being between six and seven times as wide as long. Throughout most of the body the somites are dorsally weakly widely convex, the convexity being stronger in the anterior region. There is no mid-

[1] *κομφὸς*, elegant.

dorsal depression. The venter is but little arched. It is traversed throughout by a strongly marked neural furrow.

Parapodia of the usual uniramous type, strictly lateral and very prominent, throughout exceeding the depth of the body and over nearly the entire body equalling the width of the somites. The first parapodium, *i. e.*, of somite I, represented by the neurocirrus, this being the first tentacular cirrus; that of the second by notocirrus and neurocirrus (dorsal and ventral tentacular cirri); and that of the third is the first setigerous one. In this third parapodium the notocirrus is a long tentacular cirrus; the neurocirrus is small as compared with succeeding ones but is of similar general form, being a flattened foliaceous body, subelliptic in outline, and with the long axis vertical. A typical parapodium, as, for example, the fortieth, has the setigerous division, or neuropodium, flattened in the cephalocaudal direction; with the distal end obliquely truncate, the dorsal angle being the more produced; the postsetal lip low and entire; the presetal lip more prominent, divided by a notch near the tip of the aciculum into the usual supraacicular and subacicular lobes. The neurocirrus is attached by a very broad, low cirrophore to the base of the neuropodium; the style is flattened and foliaceous but in comparison with that of the notocirrus small, not fully attaining the end of the neuropodium, vertically elongate, with the superior limb narrowed, the distal end blunt with its dorsal corner rounded, the ventral one angular. The notocirrophore is enormous in comparison with the ventral one, its width exceeding that of neuropodium and neurocirral style combined; it is strongly flattened in the anterocaudal direction; its distal end, broadly rounded, projects distad as far as the tip of the style of the neurocirrus; strongly asymmetrical, its dorsal portion projecting farther and extending dorsad. The style is subreniform, its edge evenly rounded excepting above, where it is obtusely subangulate, the dorsal auricle not free and the ventral one free for but a short distance. (Plate 16, fig. 4). Forward from the region of the fortieth somite the parapodia decrease in size; the neurocirri become larger in comparison with the notocirri, the style of each becoming relatively broader and its tip surpassing that of the neuropodium; the notocirri retain the same general form, but the cirrophore is narrower and shorter in comparison with the neuropodium with its distal end less expanded, while the style in comparison with the cirrophore is broader and its dorsal lobe larger and less narrowed toward the cirrophore. (Plate 16, fig. 1–3; Plate 15, fig. 9). At the extreme anterior end, beginning noticeably at about the seventh parapodium, the style becomes conspicuously relatively more elongate above and subangularly narrowed, the dorsal lobe becoming subtriangular; at the same time they decrease regularly and decidedly in size to the first, which occurs on somite V. Caudad from the fortieth parapodium the parapodia retain nearly the same general form and relations but increase in size to the middle region. The notocirrophore becomes proportionately still larger and distally more expanded, with the style in comparison with it narrower all the way about its line of attachment. In the posterior region the parapodia decrease regularly and strongly in size caudad. Toward the caudal end the styles of the neurocirri are narrowed, acutely pointed, lanceolate, while the notocirri remain very broad in comparison with the rest of the parapodium. (Plate 16, fig. 5, 6.)

The setae are all colorless. They are arranged in single fan-shaped series, one supraacicular and one subacicular, though the two series are not always distinctly separated. In one specimen there are, *e. g.*, ten setae in each of the two fascicles of the eleventh parapodium; in the fortieth parapodium there are twenty in each series; in a parapodium from the middle region the number is about the same; while in a parapodium about the thirtieth from the caudal end there are six in each fascicle or series, the reduction in number occurring in a general way in correspondence with the reduction in size of the parapodia. The shafts of the setae are only slightly curved. Each is rather abruptly and conspicuously enlarged at the distal end to form the socket, the enlargement being closely covered on each side of the oblique socket with short acute prickles or hairs. The blade is long and slenderly tapered, the tip fine, always conspicuously curved, with the concave edge strongly, closely, and very finely serrate. The free portion of the setae shorter than the neuropodia. (Plate 15, fig. 8).

In a paratype 195 mm. long, the fully extended proboscis is 6 mm. long, by far the greater proportion of the length belonging to the distal, unridged portion. The orifice is surrounded with seventeen low, proximally thick and contiguous, distally very shortly subconical, papillae. In other specimens the proboscis is not fully protruded, though all show clearly the proximal papillose division. In this proximal region there are twelve longitudinal rows of papillae, these being separated into groups of three by a wider middorsal, midventral, and on each side a mediolateral, smooth interval. In each row there are most commonly eighteen papillae, though the number may fall to a few less than this in the ventral series and, on the other hand, may rise as high as twenty-two or twenty-four on the dorsal side. Each papilla is strongly flattened in the direction of the longitudinal axis of the proboscis, its outline as a whole being somewhat semicircular.

The body at present is a dull grey, in part of a decidedly bluish tinge. The conspicuous styles of the cirri are brown.

LOCALITY.— Panama. Shore. 12 March, 1891. Five specimens.

This species in having twelve rows of papillae falls in the main group of the genus. It seems to be easily distinguished from other species of the genus at present known through the unusually large number of papillae in the rows upon the proboscis in connection with the form and proportions of the prostomium, and particularly the form of the notocirri and neurocirri. Its relations are indicated in the key previously given.

PHYLLODOCE Savigny.

Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 13, 42; CZERNIAWSKY, Bull. Soc. imper. nat. Moscou, 1882, **57**, p. 158 (char. emend.); MCINTOSH, British annelids, 1908, **2**, pt. 1, p. 74; BERGSTRÖM, Zool. bidrag, 1914, **3**, p. 108, 118 (char. emend.).
Carobia QUATREFAGES, Hist. nat. annelés, 1865, **2**, p. 145.
Protocarobia CZERNIAWSKY, op. cit., p. 155.
Non *Phyllodoce* Claparède, Annélides Chétop. Golfe Naples, 1868, p. 546, 575.

PHYLLODOCE FAKARAVANA, sp. nov.

Plate **16**, fig. 7–12.

This form is broadest anteriorly and narrows strongly caudad, becoming in the middle and posterior region very slender and geophiloid. The total length of the type is about 125 mm. The width at the anterior end, exclusive of the parapodia, is 2 mm., and inclusive of the parapodia, 3 mm. The width at the middle over all is but 1 mm., and in the caudal region is still less. The total number of somites in the type is four hundred and ninety-three, but it is incomplete, as an uncertain number of somites are missing from the caudal end.

The general color of the body is light yellow, darker, more brownish, at the anterior end above. The appendages are of a similar color excepting the dorsal cirri, which are rust-brown and together form a conspicuous dark stripe along each side of the body, the stripes being strongly marked caudad but less conspicuous anteriorly.

The prostomium is much wider than long (nearly 3:2). It is flattened dorsoventrally as usual. In outline as seen from above it is like a cordate body transversely truncate behind middle, and with a convexly bulging prominence at the middle of the anterior edge to which the tentacles are attached. It is widely incised behind at the middle, though the incision is not deep. It is widest a little behind the anterior corners. The tentacles project laterally from the anterior median convex lobe, extending directly ectad and nearly attaining the outer edge of the prostomium on each side. The tentacles of each side are attached close together and nearly in the same vertical line. The lower ones are a little farther apart than the upper ones. They are of the usual conical shape. The eyes are of good size. They appear to be somewhat elliptic with the longer axis transverse. Each is separated from the extreme caudal border by about its diameter, which is very nearly one sixth the total length of the prostomium. The eye is much closer to the caudolateral border. Eyes separated from each other by a space about equal to three sevenths the width of prostomium. The nuchal organ on each side appears as a rounded prominence between the extreme lateral point of the prostomium and the base of the first tentacular cirrus. (Plate 16, fig. 7).

The first three somites are free from each other and from the prostomium, with the first incomplete dorsally. Each first tentacular cirrus (neurocirrus) reaches to somite IX or X. Each dorsal tentacular cirrus (notocirrus) on the second somite reaches to somite XIX, while the corresponding ventral tentacular cirri reach only to somites IX or X. Each tentacular cirrus (notocirrus) of the third somite reaches to somite XV or to one adjacent to it.

The somites are short and closely crowded. They increase gradually in width from the first to the twentieth, from where they decrease decidedly caudad. The twentieth and contiguous somites are nine or ten times wider than long but in the middle region they are only three times as wide as long, with the actual length greater than in the anterior somites. The dorsum throughout is evenly and moderately convex. The venter is flat, with a neural furrow wide and deep anteriorly but much less pronounced posteriorly.

The parapodia are uniramous and strictly lateral in position. They are especially large, in depth not fully equalling the vertical diameter of the body in the anterior region, though nearly or quite doing so posteriorly. In length in the anterior region clearly less than half the width of the somite. On the first setigerous somite (somite III) the notocirrus is developed as a tentacular cirrus as above noted. The corresponding neurocirrus is foliaceous though small, its outer edge nearly straight, the ends rounded. The second setigerous somite has each neurocirrus similar to the preceding one, but the notocirrus is also foliaceous, small in size. (Plate 16, fig. 8). The notocirrus of the third setigerous somite is much larger than that of the preceding one, but also decidedly smaller than that of the succeeding one which is essentially of the size prevailing in the remaining portion of the anterior region generally. (Plate 16, fig. 9). A typical parapodium, as for example the seventieth, has a notocirrus consisting of a short thick cirrophore and an elongate ovatolanceolate foliaceous style. The neuropodium is compressed in the cephalocaudal direction, its distal end very obtusely angular, with an entire presetal lip and a mesally notched postsetal lip which is higher than the presetal one. The neurocirrus is small, more narrowly lanceolate than the notocirrus, and extends distad a little beyond the apex of the neuropodium. (Plate 16, fig. 11). Caudad the parapodia retain the same general structure but become much smaller. The style of the notocirrus becomes more regular and proportionately broader, more ovate, but with the apex strictly angular. The neurocirrus retains the same form as farther forward, but it is proportionately to the notocirrus broader and longer in a marked degree. In the third setigerous parapodium the style of the notocirrus is more oblong, as wide at the beginning of the distal third as across the base, but with the upper edge incised between these two regions and the apex angularly pointed though not much elongate; the neurocirrus, much exceeding the neuropodium in size, is normally elliptic and weakly sigmoid, the distal end rounded, not at all angular, the lower end free, more narrowly rounded, auriculiform. The second setigerous parapodium is similar to the third excepting for the conspicuously smaller size of the notopodium.

The setae are all colorless and transparent, and comparatively few in number. They are arranged, as usual, in single series in which they spread out somewhat in a fan-like manner. They are shorter than the neuropodia. On the seventieth somite the setae are fourteen to sixteen in each parapodium, while one from the narrower posterior region has only about eight.

The shaft of a seta as a whole is slightly curved, the convexity dorsad; at its distal end it is enlarged and spinous in the usual way. The blade is longer than the free portion of the shaft. It narrows distad to a very fine tip and as a whole is curved, the convexity dorsad, and the convex dorsal edge finely, closely serrate.

The fully extended proboscis of the type is 6 mm. long and 1.8 mm. thick. At the apex there is a ring of eighteen papillae of good size, these close together, flattened in the direction of the circumference of the ring which they form, and distally rounded. The papillose basal division is but a sixth, or slightly more, the total length of the proboscis. On it the papillae, which are short, distally rounded, and flattened in the direction of the long axis of the proboscis, are densely arranged with no trace of series. The long distal division of the proboscis shows six rounded principal longitudinal ridges which are segmented by fine transverse sulci. Some minor and incomplete intermediate ridges may also be seen.

LOCALITY. Paumotu Archipelago: Fakarava. Fringing reef. 12 October, 1899. One specimen.

The general form of the body in this species, broad anteriorly and strikingly narrowed and geophiloid in the middle and posterior regions, is a conspicuous feature. The general structure and form of the prostomium and proboscis are also distinctive characteristics, which, in connection with the form of the parapodia and the body-form, serve to separate the species from related forms. Kinberg's description of his *P. gracilis*, from the Society Islands, is too brief for certain identification. His words (Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 240) "Lobus cephalicus rotundatus" do not apply to the present species; and the further statement "branchiae foliosae superiores ovales elongati" is likewise scarcely applicable. From the more recently published figures Augener thinks it probable that his *ovalifera* may be *gracilis* Kinberg (Michaelsen & Hartmeyer, Fauna Südwest-Australiens, 1913, 4, lief. 5, p. 127). If so, the latter is then certainly widely different from the form above described.

PHYLLODOCE MEDIPAPILLATA Moore.

Proc. Acad. nat. sci., Philad. 1909, p. 237, pl. 7, fig. 3, 4.

LOCALITY. Panama. March, 1891. One specimen.

Previously known from Monterey Bay and San Diego, California.

The specimen from Panama is 92 mm. long and is composed of 212 somites. It agrees well with Moore's description, though the styles of the notocirri on the whole appear to be broader and perhaps more asymmetrical. The eyes are somewhat elliptic rather than circular. The proboscis is not at all extruded so that its characters were not compared.

PHYLLODOCE sp. a.

The specimen representing this form has at some time been completely dried, has lost all its setae, and is otherwise in such poor condition that definite identification seems impracticable. The specimen is about 125 mm. long. Near the anterior end it is 3.25 mm. wide, inclusive of the parapodia. It narrows continuously caudad and in the middle and posterior region becomes very slender much as in *P. fakaravana.* The number of somites is about four hundred. The styles of the dorsal cirri throughout, though at present much shrivelled, seem clearly to have been of an ovate-lanceolate form, with the tips often prolonged and markedly acute. The neurocirri seem to have been of a sublanceolate form, with tips rather slenderly acute. The proboscis, fully protruded but evidently much shrunken, is 3 mm. long. About its distal end is a circle of twenty-four papillae which are proximally swollen and contiguous, and distally conical and acutely pointed. The papillose area at the base is very short, the papillae rather long, not at all dense, irregularly scattered. The dorsum anteriorly is a dark brown of a pronounced reddish tinge, becoming lighter caudad and essentially yellow in the caudal region. The somites in the anterior region are very short and strongly crowded; caudad they soon become actually as well as relatively much longer. The venter has a pronounced neural furrow.

LOCALITY. Marshall Islands. Depth 12 fms. 1899–1900. One specimen which came up on the anchor.

PHYLLODOCE sp. b.

The single specimen of this species lacks the anterior end, though the number of missing somites is probably not large. The fragment is 43 mm. long. Its maximum width, exclusive of the parapodia, is near 1.8 mm., and inclusive of the parapodia and setae, 4.2 mm. The number of somites in the fragment is nearly one hundred. The body narrows to a point at the caudal end, and the somites immediately in front of the pygidium are very short and closely crowded. It also narrows moderately at the anterior end.

The general color of the body is light brown, without markings except a vague paler median longitudinal line dorsally and one ventrally, the ventral one the more pronounced.

The somites in the middle region of the body are about twice as wide a long.

The parapodia are long. The setigerous neuropodium is cylindrical, at the free end subconically narrowed and rounded. The setae are numerous and spread out in the usual fan-like manner. The shaft of each is enlarged at the distal end to form the socket for the distal blade, which is abruptly more slender, ends in a finely pointed tip, and makes a considerable angle with the shaft at the level of articulation. Nearly all the styles of the notocirri are missing from the specimen in hand; the cirrophores are attached at the base above and extend ectad, large and subcylindric, but falling much short of attaining the end of the notopodium. The neurocirri are more conspicuous. They are attached near the middle of the neuropodium; below the cirrophore each extends proximad in a free, narrowly rounded lobe, and distad in a much longer, acutely acuminate division which extends beyond the distal end of the neuropodium, but falls short of the ends of the setae; the style of each neurocirrus is typically like an ovate-lanceolate body bisected longitudinally and attached on the edge of section, though sometimes it appears curved and almost crescentic.

LOCALITY. Galapagos Islands: Hood Island, Ripple Point. Sta. 4642 (lat. 1° 30′ 30″ S., long. 89° 35′ W.). Depth 300 fms. Bottom broken shells and Globigerina. Bottom temp. 48.6° F. 7 November, 1904. One incomplete specimen.

PHYLLODOCE (?) sp. c.

A fragment lacking the anterior end is 75 mm. long. Its greatest width is at the anterior end where, exclusive of the parapodia, it measures 1.5 mm. It narrows continuously caudad, being very slender in the posterior region. It consists of approximately one hundred and forty-five somites. General color yellow.

The venter is less strongly arched than the dorsum and is marked with a neural furrow. Parapodia rather small. The notocirri are small, never exceeding the distal end of the neuropodium, exclusive of its setae, and often clearly shorter. Style ovate in outline, distally acute. The neurocirri are still smaller, of a shape somewhat similar to that of the notocirri but obliquely truncate, attached along edge of truncation. Setae and acicula colorless and transparent. The aciculum emerges distally.

LOCALITY. Between Easter Island and the Galapagos: Sta. 4705 (lat. 15° 05′ S. long. 99° 19′ W.). 300 fms. to surface. Surface temp. 72° F. 28 December, 1904. One incomplete specimen.

LOPADORRHYNCHUS Grube.[1]

Archiv naturg., 1855, **21**, p. 100; REIBISCH, Ergebn. Atlant. Ocean *** Plankton exped., 1895, **2**, H. c., p. 21, 30; BERGSTRÖM, Zool. bidrag., 1914, **3**, p. 111, 176, 180 (char. emend).

The species of this genus are pelagic forms of which none appears previously to have been recorded from the Pacific, the previously known forms coming from the Atlantic Ocean and the Mediterranean Sea. Two apparently new species occur in the present collection. They may be distinguished from the other species and from each other by means of the following key.

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[1] Occurs as a *nomen nudum* Grube in Archiv naturg., 1850, **16**, p. 128; 1851, **17**, p. 100.

Key to Species.

a. Neurocirri absent or much reduced and transformed on the first three setigerous somites.
  b. Exclusively simple setae on only the first two pairs of neuropodia....*L. krohnii* (Claparède).
  bb. Exclusively simple setae on the first three pairs of neuropodia.
    c. The fourth neuropodia bear exclusively simple setae in the ventral half, the following neuropodia bearing but one or two simple setae............................*L. nans*, sp. nov.
    cc. The fourth like the following neuropodia in having but one or two simple setae.
      d. Eyes present, distinct; cirri slender..................................*L. breve* Grube.
      dd. No eyes; cirri proximally very stout.............................*L. parvum*, sp. nov.
aa. Neurocirri absent or reduced on only the first two setigerous somites. The number of simple setae on the neuropodia decreases gradually in going caudad..............*L. viguieri* Reibisch.

LOPADORRHYNCHUS PARVUM, sp. nov.[1]

Plate 17, fig. 6, 7.

The color at present is grey of a brownish cast, the parapodia, cirri, and tentacles palest.

The two type-specimens are very small. The larger one is 4.8 mm. long and consists of nineteen somites. The other specimen is 4 mm. long and also is composed of nineteen somites. The body in outline as seen from above is widest in front of the middle, strongly narrowed and pointed caudad, and also narrowed and rounded cephalad.

The prostomium is broad, with the anterior margin mesally incurved, and the tentacles attached far apart at the anterior corners and somewhat beneath. The prostomium is depressed below the level of the peristomial region and is thin dorsoventrally. On each side the dorsal tentacle is much stouter and longer than the ventral one and extends ectad. The ventral one, which is contiguous with the dorsal one at base, projects ventrad and nearly at right angles to the axis of the dorsal one.

Ventrally the peristomium presents a subquadrangular area, or lip, wider than long, the caudal border of which projects into a corresponding excavation in the second somite. Dorsally it is apparently fused with the prostomium, but is distinguished by being distinctly more elevated as a thick transverse ridge. There are three pairs of tentacular cirri. Of these the anterior dorsals have each a distinct, short ceratophore and a stout conical style reaching to the second metastomial somite. At the base on the ventral side is a minute ventral cirrus. The posterior cirrus in form and size agrees with the anterior dorsal.

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[1] parvus, small.

The metastomial somites, as usual, are very flat ventrally and moderately arched dorsally, the body as a whole appearing flattened. The first one has its ends ventrally bent forward about the labial area, so that it appears to be excavated anteriorly. The next somite is also slightly bowed in a similar way, while the next two are concave on the anterior side but straight behind. Dorsally all the somites are double, being crossed by a distinct transverse furrow. In the anterior region this furrow divides the somites nearly equally, but in the caudal region it lies much nearer to the caudal border. The somites increase in actual length to near the middle of the body. Behind the middle, while decreasing in width, they maintain nearly the same actual length until near the caudal end. The pygidium is narrow, rather longer than wide, a little narrowed at the caudal end, and with the caudal margin a little indented. The anal cirri in the types are lost.

The first three pairs of parapodia are short and stout, increasing in size from the first to the third. They are very deep dorsoventrally, and when viewed from in front or behind, are seen to be widely convexly rounded. In ventral view they narrow to an acute edge distally. There is a small presetal lobe, and caudad of the setae a low, broadly rounded, postsetal lobe continued a short distance down the ventral side. In these first three parapodia there is no trace of true neurocirri, though at the base of each there is a swelling like that to which the styles of normal parapodia are attached. The notocirri of these anterior parapodia have cirrophores that are short, thick, and distinct. The styles are also very thick and conical in form, not extending distad noticeably beyond the end of the neuropodium proper. Caudad of the third pair the parapodia become longer and more strongly flattened in the anterocaudal direction. The postsetal lobe becomes somewhat higher and at its distal end a little more pointed. In addition there is a conspicuous presetal lobe which extends wholly across the end of the neuropodium and becomes high. On all, the notocirri continue to be present and of essentially the same conical form as those of the first parapodia. Neurocirri are also present, these being likewise of a stout, conical form, but somewhat smaller than the corresponding notocirri. (Plate 17, fig. 6).

The first three pairs of parapodia bear only simple setae. These are of the usual type, transparent, stout, distally acute, and with the tips curved caudad. In the type the normal number in each neuropodium is six, of which the most dorsal or next to the most dorsal may be stouter than the others. On the fourth parapodia in the type there are many compound setae, with simple setae represented only by a single one near the middle and an inconspicuous shorter one on the ventral side. On succeeding parapodia the number of compound setae much increases, as usual. The single aciculum in each parapodium (neuropodium) is colorless, regularly tapered distad, and straight. The compound setae are colorless. The shaft is straight, and slightly and uniformly clavately enlarged distad, with the socket very strongly asymmetrical, one edge being practically absent, or represented only by a slight angular projection on which the blade rests, and the other one very long, distally rounded, and with its acute tip a little recurved. Blades shorter than the exposed portion of shaft, narrow; narrowed at each end as usual, with serrations exceedingly fine. (Plate **17**, fig. 7).

LOCALITY. Off southwest coast of Mexico, 28 miles S. 86° E. from Galero Point: Sta. 4598 (lat. 15° 58′ N., long. 98° 13′ W.). 300 fms. to surface, vertical net. Surface temp. 84° F. 15 October, 1904. Two specimens.

The species approaches *L. breve* Grube, from which at once separable through the absence of eyes.

LOPADORRHYNCHUS NANS, sp. nov.[1]

Plate **17**, fig. 1–5.

The general color at present is dusky yellow, without markings excepting for a somewhat clearer median ventral line.

The type is 12 mm. long. The greatest width, exclusive of the parapodia, is 2.5 mm.; and inclusive of the parapodia, 3.5 mm., the parapodia all bent back obliquely at present. The body is widest at the middle; cephalad it remains broad, decreasing in width only slightly, but caudad it narrows strongly, the posterior region becoming slender. The number of setigerous somites is twenty-seven.

The prostomium is short and broad; anteriorly it is moderately convex between the tentacles. The tentacles of each side are widely separated from those of the other. The dorsal tentacle on each side is much longer and thicker than the ventral one, the ratio in each case being nearly two to one. No eyes are present.

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[1] nans, swimmer.

The tentacular cirri are six in number. The first dorsal pair are stout and pointed, and reach to the second setigerous somite; the ceratophore is distinct, a little longer than thick, and thicker than the style. At the base of each is inserted a very much smaller but distinctly developed ventral cirrus. The third tentacular cirri are similar in form and size to those of first dorsal pair. Ventrally the division to which the last tentacular cirri pertain is single, immediately caudad of the mouth, presenting a quadrate area which projects caudad over the succeeding somite, the caudal edge very slightly obtusely angular; the anterior border of this area, or lower lip, limiting the mouth behind is nearly straight, being usually scarcely incurved.

The metastomial somites in general are very flat ventrally and but moderately convex dorsally, the body as a whole appearing depressed. All are strictly simple. The first one has the ventral region projecting back a little distance over the next somite, the projecting portion being widely concavely excavated and thus appearing as two well-separated, connected, triangular projections. On the second somite there is a similar ventral extension caudad; but it is shorter and wider, and the concave excavation is but slight, the caudal margin appearing merely gently incurved from side to side. The third and succeeding somites are normal, presenting no extension of the venter whatsoever. The somites, while varying in width as previously indicated, remain of nearly constant actual length. In the widest part of the body the somites are about three times wider than long. The pygidium is a short, blunt, mesally slightly indented somite from which the cirri in the type have been lost.

The first three neuropodia are short, deep dorsoventrally but less thick at base anteroposteriorly, and distally becoming decidedly thinner and more flattened. In caudal or anterior view the margin is distally rounded, the ventral slanting portion being more oblique and less curved. They are somewhat constricted at the base. At the tip there is a slender and very short, translucent postsetal process with a low, membranous extension ventrad and a wider, thin and foliaceous but equally short, presetal lip. The fourth neuropodium is considerably longer, and the succeeding few more gradually increase in length. In these neuropodia caudad of the third the flattening distally is more pronounced; the presetal lip is broader and higher, less pointed but still obtusely angular, next becoming obliquely truncate and then convexly rounded, but in the posterior region again becoming pointed and increasing in height, while the postsetal lip disappears as such. The first three neuropodia at first sight seem to bear no ventral cirri, unless, as I am inclined to believe, the postsetal process with its ventral continuation is really the homologue of the ventral cirri of the more caudal parapodia, this view being strengthened by the presence of a swelling at the proximal end of the ventral extension suggesting a cirrophore. The position of the cirrus on the fourth neuropodia indicates a transition, that cirrus being still far distad and on the caudal side; it is thin and distally pointed. The ventral cirrus on the fifth neuropodium is still caudal in position; it is larger than that of the fourth and its free tip is longer, as is also its cirrophore; it is still, like that of the fourth, somewhat flattened. The neurocirrus of the sixth neuropodium has assumed a nearly strictly ventral position, the setae beginning distad of it instead of opposite it on the cephalic side; it is more strictly conical, and has the form and proportions prevailing in the succeeding parapodia. Notocirri are present on all parapodia, being attached on the dorsal side and closer to the base than the corresponding neurocirri. They all have thick, conical styles arising from large cirrophores and do not vary much in length, excepting a reduction in size in the slender posterior region of the body. (Plate 17, fig. 1).

On the first three neuropodia only simple setae are present, these being transparent, stout, distally acute, and strongly curved, and seven or eight in number. They project freely a considerable distance and diverge widely. Apparently but a single seta in each of these neuropodia may occur above the middle, the series being thus practically confined to the ventral half. On the fourth neuropodium, in addition to a series of six stout simple setae, one of which is on the dorsal side, there is on the dorsal side a series of much finer compound setae. (Plate 17, fig. 2–5). In succeeding parapodia the number of simple setae is two, one submedian and one ventral in position, while the number of compound setae is much increased, the series extending on the ventral as well as on the dorsal side. The aciculum is single in each neuropodium. It is colorless and tapered from base to an acute tip as usual. The compound setae are also colorless. In them the shaft is straight and is very evenly clavately enlarged distad, the socket not being abruptly wider. The socket is asymmetrical, one side rising higher than the other in an acutely pointed process which is more or less curved. The distal piece is relatively long, usually about equalling in length the free portion of the shaft; it is in outline somewhat ellipto-fusiform, its greatest width much exceeding that of the shaft; the serrations along one edge are exceedingly fine.

Locality. Between Peru and Easter Island: Sta. 4680 (lat. 17° 55′ S., long. 87° 42′ W.). Surface. Surface temp. 68° F. 7 December, 1904. One specimen.

This species in its structure throughout approaches *Prolopadorhynchus nationale* (Reibisch). It differs decidedly, however, according to Reibisch's account and figures, in having the neurocirri of the first three parapodia distal in position, very inconspicuous, and free only at the extreme tip, which appears as a postsetal process. The parapodia of the middle region are broader and less acuminate. The distal piece of the compound setae is somewhat differently shaped and the teeth are much finer and more numerous. It is decidedly larger in size than the type of *nationale* and the number of somites is greater.

There is some doubt as to the possibility of maintaining Prolopadorhynchus Bergström on the basis of the difference in the ventral cirri of the first parapodia. From examination of the two species of Lopadorrhynchus described above I find the apparent absence of neurocirri to be due to a special modification in them and change in position; and I much suspect that intergradation between this condition and that in which the neurocirri are normal will be found to occur, such a transition, in fact, being plain in the fourth parapodia of *L. nans*, sp. nov. The two species at present referred to Prolopadorhynchus may be separated as follows.

a. Ventral cirri with a distinct thread-like appendage at the tip; no simple setae on parapodia caudad of the fourth . . . . *P. appendiculatum* (Southern).
aa. Ventral cirri with no such appendage; two or three simple setae on all parapodia caudad of the fourth . . . . *P. nationale* (Reibisch).

MASTIGETHUS, gen. nov.[1]

Body short, more tapered caudad, depressed, the ventral surface flattened; somites few.

Eyes present.

Tentacles four, anterior. No median tentacle or nuchal papilla. On each side of the head a large branchiform nuchal organ composed of many simple branches or filaments.

Behind the nuchal organ on each side two large tentacular cirri of typical cylindroconical form and a dwarf ventral one.

Parapodia uniramous. No true ventral cirri present on any of the first four pairs.

Both simple and composite setae present of which the latter may be absent from the most anterior parapodia.

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[1] μάστιξ, a lash, and ἦθος, character.

Proboscis with margin smooth. Bearing on each side toward the distal end a single, long, isolated papilla or filament.

Genotype.— *M. errans*, sp. nov.

This genus differs from Lopadorrhynchus in having the conspicuous, long, finger-like papilla on each side of the proboscis and in the presence of the highly peculiar nuchal organs.

Mastigethus errans, sp. nov.[1]

Plate **17**, fig. 8, 9; Plate **18**, fig. 1–6.

General color of body brown, lighter at ends. Appendages in posterior region verging toward brownish yellow.

The length of the type is 7.5 mm.; the greatest width, exclusive of the parapodia, 1.6 mm., and inclusive of parapodia, 3.5 mm. The body proper narrows a little from the anterior end over a few somites caudad and then again gradually widens to the middle region, from where the narrowing to the caudal end is continuous and more pronounced. The total number of somites is twenty-three.

The proboscis is shaped like an inverted, deep, square-ended scoop, being very short on the ventral side but long on the dorsal; the margin is wholly smooth, as is also the surface excepting for a long, slenderly cylindrical or thread-like papilla on each side attached a little caudad of the slanting margin. The tentacles of each side are very widely separated from those of the other. The dorsal tentacle on each side is decidedly larger than the ventral one and in the type projects directly laterad, curving backward at the tip. The eyes are small and widely separated, one being situated immediately caudad of each dorsal tentacle. The prostomium as a whole is transversely narrowly oblong, both anterior and posterior margins being nearly straight. (Plate **17**, fig. 8, 9).

The branchiform organ on each side, arising in the position usually occupied by the ordinary nuchal papilla, expands as a membrane from a rather narrow pedicel, the membrane bearing along both the dorsal and the ventral edge a series of four or five finger-like filaments, each of which is simple and is traversed by a central blood-vessel.

Peristomial rings narrow. Anterior margin bordering the mouth straight and parallel with the caudal margin, which is not at all extended caudad over the succeeding somite. The two principal tentacular cirri on each side are of the same form and length, reaching to the anterior border of the third setigerous somite. Below the posterior of these is a minute ventral cirrus.

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[1] errare, to wander.

The metastomial somites are much depressed. They are short and do not vary much in length. Back of the second one each is double, being crossed above by a distinct transverse sulcus or furrow, the anterior division being shorter than the posterior in the anterior somites but equal to it or nearly so in the middle and posterior regions. In the preserved specimen there is a narrow neural furrow which is not evident on the first three somites.

The first three somites are conspicuously differentiated from the others in having their parapodia shorter and much more nearly cylindrical, being decidedly thicker in the anteroposterior direction. They bear no true neurocirri, though a thin and very narrow postsetal membrane free at the tip may be homologous. The presetal membrane is very low, forming but a narrow fringe. The fourth parapodium agrees with the first three in lacking a neurocirrus; but it contrasts strongly in being larger and decidedly compressed in the anteroposterior direction, as also in having the thin presetal membrane conspicuously long, obtusely angular at the middle distally, extending across entire end and projecting beyond at its lateral ends. The fifth parapodium is similar to the fourth, but is somewhat longer and bears a typical neurocirrus. The eighth parapodium has attained the maximum length. Each notocirrus is small; it is attached well toward the base of the parapodium, arising from a swollen base or cirrophore; the style is conical, ending in a short produced acute tip. Notocirri were not present on the first two pairs of parapodia, having apparently been broken off. The notocirri remain of nearly the same size throughout. The neurocirri are very small and conical in shape, each arising from a distinct cirrophore a little proximad of the middle of the neuropodium. (Plate 18, fig. 1).

The first three pairs of neuropodia bear only simple setae, which are stout, long, distally curved, and often weakly sigmoid. They diverge widely and are mostly on the ventral slope of neuropodium. The fourth neuropodia have on the ventral side a series of five simple setae of which the two most proximal are reduced; normally there are probably compound setae on the dorsal side, but all are missing on the type, probably because of rubbing. Succeeding neuropodia with but one or two (mostly two) stout, simple setae, and with numerous compound setae both above and below. The compound setae have shafts straight, or but slightly curved, gradually clavately enlarged distad, as usual, and ending in an asymmetrical socket of the ordinary type, the tip of the process bent to one side. The distal piece or blade is very thin and broad, of the common clavato-elliptic outline, with the teeth few, minute, and widely separated.

Locality. Between Mexico and Paumotu Islands: Sta. 4742 (lat. 0° 04′ S., long. 117° 07′ W.). 300 fms. to surface. Surface temp. 77° F. Exped. 1904–1905. One specimen.

PELAGOBIA Greeff.

Zeitschr. wiss. zool., 1879, **32**, p. 247, pl. 14, fig. 23–25; Reibisch, Ergebn. Atlant. Ocean * * * Plankton-exped., 1895, **2**, H. c., p. 21; Bergström, Zool. bidrag., 1914, **3**, p. 112, 185, 186.

Key to Species.

a. Shaft of setae wholly smooth..*P. viguieri* Gravier.
aa. Shaft of setae more or less serrate.
  b. No eyes; teeth of shaft of setae easily seen under moderate magnification. .*P. serrata* Southern.
  bb. Eyes; teeth of shaft of setae visible only under strong magnification. . . .*P. longicirrata* Greeff.

PELAGOBIA VIGUIERI Gravier.

Deux. exped. Antarc. Franc. 1908–1910. Annel., 1911, p. 62; Bergström, Zool. bidrag., 1914, **3**, p. 188.
?*Pelagobia longicirrata* Ehlers, Nat. Antarc. exped. Nat. hist., 1912, p. 14.
Pelagobia viguieri Bergström, Zool. bidrag., 1914, **3**, p. 188.

The general color is yellow, with the prostomium and first few somites often more or less distinctly orange. The cirri appear paler, more whitish. The setae are colorless and transparent.

A specimen 12 mm. in length has a maximum width, exclusive of the parapodia, of 1.5 mm., and to the end of the setae, of about 4 mm. The number of somites is normally near thirty-three. Back of the head the body is constricted over several somites, then widens gradually but decidedly to the middle region, behind which it narrows again gradually to the pointed caudal extremity.

The prostomium proper is short and broad, but clearly narrower than the succeeding somite. It is broadly rounded anteriorly, bulging more convexly between the tentacles. The tentacles of each side are widely separated from those of the opposite side. They are short and very slender, acuminate, and translucent.

The first somite is clearly discrete from the prostomium and from the second somite. It is thickened, projecting out on all sides beyond the prostomium and usually the second somite as well. It is of nearly the same length as the prostomium, or mesally above scarcely shorter. The tentacular cirri subequal, rather long, reaching caudad to the sixth somite, or sometimes not so far. The style of each is conspicuously acuminate distad, with the tip very slender. The ceratophore considerably thicker than the style at its base and but little longer than thick. The setigerous lobe short, with its setae projecting conspicuously.

The second somite is typically narrower than the first, but may be equal to it or occasionally may exceed it. It is of the same length as the first. The third somite is always narrower than the first and usually than the second. The length of the somites does not vary much with the marked increase in width in the middle region, but they are shortened toward the narrowed caudal end. The convexity of the somites is but moderate, more marked in the anterior region, and about equal ventrally and dorsally.

The parapodia are strictly lateral in position. The neuropodia of those of the second somite are short and conical, those of the next somite abruptly longer, while the next few increase in length more gradually until the maximum is reached. In the posterior region they again gradually decrease in length. The neuropodia are cylindroconical and rather long, in the middle region being about four fifths as long as the width of the somite proper. The cirri are longer than the neuropodia and attain to near the end of the setae. On a typical parapodium, as occurring over the greater part of the body, the notocirrus is attached distad of the middle. Its cirrophore is swollen and continuous with the notopodium, which is separated by a furrow along each side. The style acuminate or subulate, and not attaining fully the ends of the setae. The neurocirrus is attached on the ventral surface almost directly opposite the notocirrus, which it closely resembles in form and size.

In each parapodium is a single fully developed aciculum; the acute tip of this extends through a slender prolongation at the tip of the neuropodium and projects freely a considerable distance beyond the surface. The setae are all compound. Each has a long, uniform shaft which is wholly smooth, showing no serrations, and ends in a deep, not transversely thickened socket which is asymmetrical. The blade is long, attenuated distad, and acute at the tip; in side view it is seen to be boldly and closely serrate from base to tip.

Localities. Between the Galapagos Islands and Peru: Sta. 4646 (lat. 4° 02′ S., long. 89° 16′ W.). 300 fms. to surface. Surface temp. 70° F. 8 November, 1904. Two broken specimens.

Between the Galapagos Islands and Peru: Sta. 4649 (lat. 5° 17′ S., long. 85° 20′ W.). 300 fms. to surface. Surface temp. 70° F. 10 November, 1904. One broken specimen.

Off Peru: Sta. 4646 (lat. 11° 30′ S., long. 87° 19′ W.). 300 fms. to surface.

Surface temp. 68° F. 17 November, 1904. Several specimens, mostly with caudal ends missing.

Off Peru: Sta. 4665 (lat. 11° 45′ S., long. 86° 05′ W.). 300 fms. to surface. Surface temp. 68° F. 17 November, 1904. Several specimens, also mostly incomplete.

Off Peru: Sta. 4667 (lat. 12° S., long. 83° 40′ W.). 300 fms. to surface. Surface temp. 68° F. 18 November, 1904. One complete and two broken specimens.

Off Peru: Sta. 4655 (lat. 5° 57′ 30″ S., long. 81° 50′ W.). Surface temp. 64° F. One specimen.

Off Peru: Sta. 4668 (lat. 12° 09′ S., long. 81° 45′ W.). The field-label says "300" in one place, while "bottom" is written across the end. The latter is doubtless an error and the specimens are probably from near the surface. Surface temp. 67° F. 19 November, 1904. Three specimens.

Between Peru and Easter Island: Sta. 4679 (lat. 17° 26′ S., long. 86° 46′ W.). 300 fms. to surface. Surface temp. 69° F. 7 December, 1904. Several specimens, mostly broken.

Between Peru and Easter Island: Sta. 4680 (lat. 17° 55′ S., long. 87° 42′ W.). 300 fms. to surface. Surface temp. 68° F. A fragment of one specimen.

Off Central America: Sta. 4613 (lat. 9° 43′ N., long. 86° 15′ W.). Surface. Surface temp. 80° F. 19 October, 1904. Two broken specimens.

Off Peru: Sta. 4671 (lat. 12° 07′ S., long. 78° 28′ W.). Surface. Surface temp. 66° F. 20 November, 1904. Five specimens.

Off Peru: 4673 (lat. 12° 30′ 30″ S., long. 77° 49′ 30″ W.). 300 fms. to surface. Surface temp. 67° F. 21 November, 1904.

Between Easter Island and the Galapagos: Sta. 4707 (lat. 12° 53′ S., long. 97° 47′ W.). Surface to 300 fms. Surface temp. 72° F. 29 December, 1904. One specimen.

Between the Galapagos and Paumotu Islands: Sta. 4717 (lat. 5° 11′ S., long. 98° 56′ W.). 300 fms. to surface. Surface temp. 75° F. Several specimens with probosces extended.

Off Peru: Sta. 4676 (lat. 14° 29′ S., long. 81° 24′ W.). 300 fms. to surface. Surface temp. 69° F. 5 December, 1904. One small specimen.

Between the Galapagos and Paumotu Islands: Sta. 4720 (lat. 7° 13′ S., long. 102° 31′ 30″ W.). Surface. Surface temp. 76° F. 14 January, 1905. One very small specimen.

Between the Galapagos and Paumotu Islands: Sta. 4730 (lat. 15° 07′ S., long. 117° 91′ W.). 300 fms. to surface. Surface temp. 79° F. 30 January, 1905. Two specimens.

Between the Galapagos and Paumotu Islands: Sta. 4736 (lat. 19° S., long. 125° 05′ W.). 300 fms. to surface. Surface temp. 81° F. 23 January, 1905. One specimen.

NANS gen. nov.[1]

Body short, tapered both cephalad and caudad, moderately depressed. Number of somites small.

Two pairs of eyes present. Tentacles two pairs, no unpaired one and no nuchal papilla.

Somites all distinct from each other and from the prostomium.

Normal parapodia biacicular, bearing both notocirrus and neurocirrus, these filiform.

Setae all simple, but of two types, a stout ventral crochet form, and a longer, thin and flat form borne by the notopodial branch. Only the first type detected on somite I in the type-species.

Character of proboscis undetermined.

GENOTYPE.—*N. simplex*, sp. nov.

This genus is at once distinguished in wholly lacking composite setae, the simple setae, however, being of two sharply distinct types. In other features, as well, the genus does not conform to any of the subfamilies into which Bergström in his recent monograph (Zool. bidrag., 1914, **3**, p. 117) divides the family. From the Eteoninae, which it approaches, for example, in the number and arrangement of the tentacular cirri, it differs in having the notocirrus of the first normal segment strongly developed instead of reduced. The Lugiinae have similarly two pairs of tentacular cirri, but these pertain to two somites instead of to a single one. It becomes necessary, therefore, in this system to place Nans in a new subfamily, the Nantinae. The relationships of the subfamilies are indicated in the general key (p. 99).

NANS SIMPLEX, sp. nov.[2]

Plate **18**, fig. 7, 8; Plate **19**, fig. 1–4.

The body is colorless and transparent.

Widest near the middle of length and conspicuously narrowed both cephalad and caudad. Compressed, but little arched either dorsally or ventrally. The length is 5.5 mm. The number of somites is twenty-nine.

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[1] nans, a swimmer.

[2] simplex, simple.

The prostomium is transversely oblong, with the anterior margin broadly slightly convex and weakly notched at the middle. In the type all the tentacles excepting one are lost, but the number seems clearly to have been four. The tentacle is very short, slightly clavate, and is situated far out toward the anterolateral corner and in front of the eye. There are two pairs of eyes, one dorsal and one ventral in position, all small, but the ventrals much larger than the dorsals. The dorsal eyes are elliptic, with their axes longitudinal and inclined to each other. They are wide apart. The ventral eyes are elliptic, or rather somewhat obovate, and are similarly wide apart, each being at the anterolateral corner. (Plate 19, fig. 1).

The peristomium is of nearly the same length and width as the prostomium, the two together being shorter than the second somite. The peristomium is setigerous, but the setigerous papilla is very low and rounded. The setae are few, and, so far as could be judged from the type, exclusively of the short, stout type prevailing in the neuropodia of ordinary parapodia. There are two pairs of tentacular cirri, of which the dorsals are lost. The ventral ones are small, nearly of the same size as the tentacles and the ventral cirri of the ordinary parapodia, though not so much tapered as the latter usually are. (Plate 19, fig. 1).

The first ones of the metastomial somites are less than twice as wide as long. Those in the middle region are a little more, and those in the caudal region are decidedly less than twice as wide as long.

The pygidium is subcylindrical, with the caudal margin running to a very obtuse angle at the middle. (Plate 19, fig. 2).

The parapodia are biramous, a shallow notch at the distal end separating a broad but low, rounded, or mesally somewhat angular lobe from a much smaller, similarly short ventral lobe. The parapodium as a whole is about half as long as the width of the somite; deeper dorsoventrally than anterocaudally; narrowed distad both as viewed from above and from in front. The neurocirri are small, cylindrical and slender and comparable in size to the tentacles and ventral tentacular cirri, moderately tapered distad, each attached distad of the middle of the neuropodium and a little surpassing the end of the latter. The notocirri are cylindrical, distally tapering to a point; in the anterior region long, clearly exceeding the dorsal setae, and when laid across the somite extending beyond the tip of the opposite parapodium; becoming shorter caudad; each is attached above near the distal end of the parapodium. The notocirri of the posterior region in the type have been lost.

The acicula in each parapodium are two in number, one extending into each lobe, and narrowing distad into the usual acute point. The notopodial aciculum is distally more slender than the neuropodial, with the tip curved somewhat dorsad. The parapodial surface is angularly elevated about the tip of each aciculum. The notopodial setae are numerous and long, though shorter and more slender ones occur in each fascicle. Each typical seta is flattened, blade-like, of nearly uniform thickness and width, excepting distally, where it narrows to an acute point. The neuropodial setae are much shorter, stout, and cylindrical. They vary in length and thickness among themselves, the ventral ones being the shorter and more slender. They are gently curved, commonly showing a weakly sigmoid flexure. At the tip each bears an acute, distally curved tooth, with on the opposite side a weak, obtuse, angular extension. (Plate **18**, fig. 7, 8; Plate **19**, fig. 3, 4).

LOCALITY. Gilbert Islands: off Apaiang. Surface, by electric night light. 3 January, 1900. One specimen.

The character of the proboscis in this interesting form could not be determined in its retracted condition. The form is at once distinguishable by the characters presented in the biacicular parapodia and the setae.

PONTODORIDAE.

Closely related to the Phyllodocidae *sens. str.*, and by most authors hitherto included in a single family with them, are the members of three small families, as defined by Bergström, not represented in the present collections. Of these the first is the Pontodoridae, containing at present only the genus Pontodora Greeff, which differs from the true phyllodocids in having only two tentacles, in having a pair of palpi, and in having the parapodia enormously elongate. The genus is pelagic.

IOSPILIDAE.

The second family, Iospilidae, is characterized by the complete absence of tentacles and the presence of a pair of palpi. The proboscis is unarmed or with two hard lateral papillae. Parapodia and eyes normal. All species are pelagic. There are three genera which may be separated as follows:

Key to Genera.

a. Notocirrus as long as the setigerous lobe.
  b. Foliaceous ventral and dorsal cirri present on the first free somite; palpi as long as the first tentacular cirri, visible from above.................................*Paraiospilus* Viguier.
  bb. No such foliaceous cirri on first free somite; palpi small, not visible from above. *Iospilus* Viguier.
aa. Notocirri shorter than the setigerous lobe...........................*Phalacrophorus* Greeff.

LACYDONIIDAE.

The third family, the Lacydoniidae, embraces only Lacydonia, which differs from the phyllodocids proper as well as from the other phyllodocoids in having four, well-developed, true jaws like those of the Aphroditidae. There are four tentacles but no palpi, and only a single pair of tentacular cirri. Non-pelagic.

OTOPSIDAE.

Of more doubtful relationship is the family Otopsidae recently established by Ditlevsen for the new genus Otopsis, a form with three tentacles, no palpi, no armature to the proboscis, and no eyes. Setae all simple (Danish Ingolf exped., 1917, **4**, pt. 4, p. 67).

PISIONIDAE.

This family is not represented in the collections made by the ALBATROSS. It was created by Levinsen (1866) for the genus Pisione, which Grube had applied (1857) to his species *P. oerstedi* occurring near Valparaiso, and which he had placed in the Phyllodocidae, regarding it as a form transitional between that family and the Glyceridae. Ehlers points out its resemblances in different characters to the Aphroditidae, Nepthydidae, Hesionidae, Syllidae, and Glyceridae. He added a second species, *P. contracta*, from the South American shore near Callao (Festschr. K. gesellsch. Göttingen, 1901, p. 60). A second genus, Prageria, is added by Southern (Proc. Royal Irish acad., 1914, **31**, pt. 47, p. 61).

Key to Genera.

a. Genital papillae greatly elongate; notocirrus of second parapodia filiform, elongate like a tentacular cirrus...*Pisione* Grube.
aa. Genital papillae absent; notocirrus of second parapodia small, globular, as in the succeeding ones *Prageria* Southern.

Alciopidae.

The alciopids are exclusively pelagic forms, in which the body is for the most part unpigmented and of crystalline transparency. A few forms are brown, or, more commonly, violet in color. They are ordinarily small, or but moderate in size, with the body cylindrical.

The prostomium bears always four paired tentacles and a median unpaired tentacle. There are no palpi. A highly characteristic feature in the family is in the exceptional development of the two eyes, which are normally very large, protruding conspicuously on each side of the head.

Nuchal organs rudimentary, or wholly lacking.

A number of somites behind the prostomium are obviously different, as in the character of their parapodia, from the succeeding ones, the first normal parapodia appearing at a considerable distance from the prostomium.

The parapodia are uniramous with notocirri and neurocirri foliaceous and containing well-developed mucous glands. The parapodia may or may not have at their distal ends cirriform prolongations.

The setae may be all simple, all composite, or both composite and simple types may be present. Simple setae of a stouter, crochet-type are often present.

The nephridia are as in the phyllodocids and other members of the Phyllodocoidea.

Proboscis either unarmed, or with small denticles.

An interesting feature in this family is that some and possibly all of the species, while free as adults, in larval stages live symbiotically or parasitically on or in other pelagic animals. The genus Alciopina of Claparède and Panceri (Mem. Soc. Ital. sci. nat. 1867, **3**, no. 4, p. 8, fig. 2–15), according to Greeff, (Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 45) was apparently founded on such a larval form found in the alimentary tract of *Cydippe densa* Forskal.

The close affinity of this family with the Phyllodocidae *sens. str.* is evident, not only in external morphology, but in detailed internal structure as well.

The alciopids have been found in all the great oceans, but the great majority have been secured in the Atlantic and in the Mediterranean Sea. Apstein (Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 22) lists eighteen species as known from the Atlantic, eleven from the Mediterranean, six each from the Pacific and Indian Oceans, and one from the Antarctic. Izuka (Journ. Coll. sci. Imper. univ. Tokyo, 1914, **36**, p. 2–9) mentions four additional species from off Japan, making a total from the Pacific of ten species previously known.

Most species of the family, as might be expected from their habits, are widespread, only a few species, such as *Vanadis antarctica,* being restricted to one ocean.

The alciopids are represented but poorly in the collections made by most exploring expeditions. Thus, in the extensive material secured by the Challenger, only five species occurred, two of these being present only as fragments. This is due partly to the difficulty of collection and partly to the difficulty of properly preserving these delicate organisms. The collections made by the Albatross in the Tropical Pacific are interesting and comparatively rich, particular attention apparently having been given to Plankton collecting by the expedition of 1904–1905. Ten species are represented, some of them by an abundance of material. Of these species, six are described as new, two of them representing new genera. The number of species from the Pacific is thus raised to seventeen.

Key to Genera.

a. Parapodia without cirriform appendages.
  b. Setae all of one kind.
    c. Setae simple, capillary .... *Alciopa* Audouin & Milne Edwards.
    cc. Setae composite .... *Torea* Quatrefages.
  bb. Setae of different types.
    c. Capillary setae and stouter crochets .... *Corynocephalus* Levinsen.
    cc. Composite setae and crochets .... *Plotohelmis,* gen. nov.
aa. Parapodia with one or two cirriform appendages.
  b. Each parapodium with a single cirriform appendage.
    c. Setae all composite.
      d. First two somites distinct from each other .... *Vanadis* Claparede.
      dd. First two somites coalesced .... *Mauita,* gen. nov.
    cc. Setae of two different types.
      d. Simple capillary setae and crochets .... *Callizonella* Apstein.
      dd. Composite setae and crochets .... *Rhynchonerella* A. Costa.
  bb. Each parapodium with two cirriform appendages.
    Setae all composite .... *Halodora* Greeff.

Alciopa Audouin and Milne Edwards.

Cuvier's Règne anim. ed. 2, 1829, **3**, p. 202; Ann. sci. nat., 1833, ser. **1**, **29**, p. 236; Hist. nat. litt. France, Annélides, 1834, **2**, p. 214; Apstein, Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 6.

Alciope Ehlers, Borstenwürmer, 1864, p. 176; Quatrefages, Hist. nat. annelés, 1865, **2**, p. 157.

Krohnia Quatrefages, *Op. cit.*, p. 157.

Alciopa cantrainii (Delle Chiaji).

Greeff Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 57, pl. 1, f. 4, pl. 2, fig. 14–18; Apstein, Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 7, pl. 5, fig. 53.

Naiades cantrainii Delle Chiaje, Descriz. anim. invert. Sicilia, 1828, **3**, p. 155, pl. 155, fig. 14, 18, 21.

Alciopa reynaudii Krohn, Archiv. naturges., 1845, **11**, p. 172, pl. 6, fig. 1–6.

Alciopa edwardsii Krohn, Archiv. naturges., 1847, **13**, p. 39; Grube, Archiv. naturges., 1850, **16**, p. 305; Hering, De Alcioparum partibus genitalibus organisque excretoriis Lipsiae, 1860, p. 3, 5; Sitzungsb. K. akad. wissensch. Wien. Math. naturw. klasse, 1892, **101**, p. 721. pl. 1, 2. Ehlers, Borstenwürmer, 1864, p. 176.
Krohnia edwardsii Quatrefages, Ann. sci. nat., 1850, **13**, p. 118.
Liocapa vitrea A. Costa, Ann. Mus. zool. Univ. Napoli, 1864, **2**, p. 167.
Liocapa cantrainii Claparède, Annélides Chétop. Golfe Naples, 1868, p. 252.
Alciopa microcephala Viguier, Arch. zool. expér., 1886, ser. 2, **4**, p. 104.

Locality. Between Peru and Easter Island: Sta. 4681 (lat. 18° 47′ S., long. 89° 26′ W.). 300 fms. to surface. Surface temp. 69° F. 8 December, 1904. The anterior ends of two specimens.

The fragments are small, and consist of fourteen and seventeen somites respectively. They do not at present have the characteristic transparency of *cantraini*, but this is probably due to the preservation. At present they are light brown. The parapodia appear stouter, and the cirri also somewhat more slender than usual in the species, the whole, in fact, appearing to be a somewhat more slender form. In view, however, of the close agreement in the eyes, tentacles, tentacular cirri, and the anterior region in general, the slight differences noted may be neglected. *A. cantrainii* is widespread in the Mediterranean Sea and the Atlantic Ocean, and has been previously recorded from the Pacific as well.

Torea Quatrefages.

Ann. sci. nat., 1850, **13**, p. 34; Hist. nat. annelés, 1865, **2**, p. 159.
Liocapa A. Costa, Ann. Mus. zool. Univ. Napoli, 1862, **1**, p. 87.
Liocape Costa, *Ibid.*, 1864, **4**, p. 55.
Asterope Claparède, Annélides Chétop. Golfe Naples Suppl., 1870, p. 107; Greeff, Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 55; Apstein, Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 7.

Asterope Claparède has been used by most writers since the date of its establishment. But as *vitrea*, the type-species of Torea, is now recognized as a synonym of *candida*, the type of Asterope, the two genera are completely synonymous and Torea, having a priority of twenty years, must be used. Liocapa Costa, also a synonym, has precedence over Asterope. Its type-species, *vertebralis*, is also identical with *candida*.

Torea pelagica, sp. nov.

Plate **24**, fig. 4–9.

The body is very slender. The anterior fragment of the type, consisting of the head and eighteen somites, is, without the proboscis, 4 mm. long. The somites immediately succeeding the head are very narrow, the others increasing in length caudad to the end of the fragment, where the width, exclusive of the parapodia, is, however, only .6 mm. and, inclusive of the parapodia, 1.4 mm., and to the tips of the setae near 3 mm. A second fragment, presumably from the same specimen, farther caudad, is 9 mm. long, and consists of twenty somites. A third fragment, which, judging from its coarseness is possibly from the middle region of a second and larger specimen, is 17 mm. long, and consists of sixty-three somites.

The specimens at present are yellow and somewhat translucent, though in life probably transparent. The segmental organs are mostly dark in color, as usual.

The prostomium presents anteriorly in the middle a rounded protuberance which is retracted or little obvious in some paratypes. From the dorsal surface arises a slenderly conical median tentacle which is vertical, and typically curves back close against the elevated portion of the prostomium between the eyes. Farther forward and toward the sides are borne the paired tentacles, the ventral of which are also conical. The eyes have their lenses directed strictly outwards, the same axis being common to the two. (Plate **24**, fig. 5).

The proboscis in the type is about 3.8 mm. long, inclusive of its processes. It is slender, widening gradually from base to distal end, and is smooth. At the end it bears two long prehensorial processes, but otherwise lacks any papillae or other processes about the opening. (Plate **24**, fig. 4).

The caudal edge of the mouth is straight. The tentacular cirri are nearly equal in length. They are rather short, nearly cylindrical, but somewhat narrowed and rounded at the distal ends.

The somites are mostly smooth and entire, but a few of the most anterior show a division into three or four rings, the parapodia being attached to the most caudal of these. In the posterior portion of the anterior fragment of the type the somites are twice as wide as long, while the third parapodia-bearing somite is only once and a half as wide as long. The first parapodia are short, but increase regularly in length and thickness in going caudad. The anterior neurocirri appear to be much reduced in size, and are thin and ovate-acute in form. Farther caudad the neuropodia become conspicuous and strongly setigerous. They are cylindrical, with a conical distal end, through the acutely prolonged tip of which protrudes the aciculum. The notocirri are foliaceous and very broad, oval-orbicular, distally broadly rounded or even slightly notched at middle. The neurocirri of the typical somites are much smaller than the corresponding notocirri. They are attached farther distad than the notocirri, but still distinctly proximad of the middle of the neuropodium. Each is ovate in outline, with the tip rounded excepting in the very small anterior ones, in which it is acute. (Plate **24**, fig. 7–9).

The setae are very long, fine, and transparent, with the distal pieces slenderly acute. (Plate **24**, f. 6).

LOCALITY. Between Callao, Peru and Easter Island: Sta. 4680 (lat. 17° 55′ S., long. 87° 42′ W.). Surface. Surface temp. 68° F. 7 December, 1904. Three fragments.

Between Easter Island and the Galapagos: Sta. 4700 (lat. 20° 29′ S., long. 103° 26′ W.). Surface. Surface temp. 74° F. 25 December, 1904. Several specimens.

As compared with *A. candida* Claparède, the type of the genus, and thus far only known from the Mediterranean, this species differs conspicuously in a number of characters. The proboscis possesses no tubercles about the opening, such as are so well developed in *candida*, while the prehensorial processes or prongs are much longer. The median tentacle is long and slenderly cylindro-conical, instead of blunt and button-like. The notocirri and neurocirri are markedly different in form and relative size.

VANADIS Claparède.

Annélides Chétop. Golfe Naples, Suppl., 1870, p. 116; GREEFF, Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 56; APSTEIN, Ergebn. Atlant. Ocean * * * Plankton- exped., 1900, **2**, H. b., p. 8.

The species of this genus may be separated by means of the following key:

Key to Species.

- *a.* With only three pairs of tentacular cirri.
  - *b.* Median antenna attached nearly at level of anterior border of eyes; lenses of eyes directed lateroventrally, not visible from above.
    - *c.* Eyes dorsally separated; ventral paired tentacles longer than the dorsals. *V. minuta* Treadwell.
    - *cc.* Eyes in contact dorsally; ventral paired tentacles shorter than the dorsals. *V. grandis* Izuka.
  - *bb.* Median tentacle attached nearly on a level with the middle of eyes.
    - *c.* Body colorless or but weakly tinged.............................. *V. formosa* Claparède.
    - *cc.* Body distinctly colored, deep violet-brown............................ *V. violacea* Apstein.
- *aa.* With more than three pairs of tentacular cirri.
  - *b.* With four pairs of tentacular cirri.
    - *c.* Head deeply incised between the eyes................................ *V. studeri* Apstein.
    - *cc.* Head without such incision between the eyes.
      - *d.* Optic lenses directed laterad.................................. *V. crystallina* Greeff.

dd. Optic lenses directed ventrad . . . . *V. antarctica* McIntosh.
bb. With more than four pairs of tentacular cirri.
c. Tentacular cirri five pairs; segmental glands in an unbroken series . . . . *V. ornata* Greeff.
cc. Tentacular cirri seven pairs; segmental glands in a broken series, not present on all somites of the middle and posterior regions . . . . *V. longissima* (Levinsen).

VANADIS FORMOSA Claparède.

Annélides Chétop. Golfe Naples, Suppl., 1870, p. 116, pl. 10, fig. 3; APSTEIN, Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 8, pl. 1, fig. 1–6.
Vanadis pelagica GREEFF, Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 67, pl. 3, fig. 33, 34.
Vanadis greeffiana GRUBE, Monatsb. K. preuss. akad. Berlin, 1878, p. 524.
Vanadis longicauda APSTEIN, Jahrb. Hamburgischen wissensch. anstalten, 1891, p. 5, fig. 3–8.
Vanadis latocinata APSTEIN, *Op. cit.*, p. 7, fig. 9–11.
Alciopa krohnii HERING, Sitzungsb. K. akad. wissensch. Wien. Math. naturw. klasse, 1892, **101**, p. 738, pl. 4, fig. 1–13.
Vanadis fusco-punctata TREADWELL, Bull. U. S. fish comm., 1906, 1903, pt. 3, p. 1159, pl. 3, fig. 29–31.

LOCALITIES. Between Peru and Easter Island: Sta. 4691 (lat. 25° 27′ S., long. 103° 29′ W.). 300 fms. to surface. Surface temp. 73° F. Exped. 1904–1905. One specimen.

Between Peru and Easter Island: Sta. 4682 (lat. 19° 07′ 30″ S., long. 90° 10′ W.). Surface. Surface temp. 69° F. 8 December, 1904. Several broken specimens taken at the surface.

Between Peru and Easter Island: Sta. 4686 (lat. 22° 02′ S., long. 95° 52′ W.). Surface. Surface temp. 71° F. 10 December, 1904. Anterior portion of one specimen.

Between Easter Island and the Galapagos: Sta. 4706 (lat. 14° 19′ S., long. 98° 46′ W.). Surface. Surface temp. 72° F. 28 December, 1904. One complete specimen in three pieces, and several other fragments.

Between Easter Island and the Galapagos: Sta. 4704 (lat. 16° 55′ S., long. 100° 25′ W.). 300 fms. to surface. Surface temp. 73° F. 27 December, 1904. Fragments of three specimens.

Off Peru: Sta. 4669 (lat. 12° 13′ S., long. 80° 24′ W.). Surface. Surface temp. 67° F. 19 November, 1904. Two worn fragments, somewhat doubtfully referred.

Between the Galapagos and Paumotu Islands: Sta. 4707 (lat. 12° 53′ S., long. 92° 42′ W.). Surface. Surface temp. 72° F. 29 December, 1904. One specimen, lacking caudal end.

Between Easter Island and the Galapagos: Sta. 4711 (lat. 7° 43′ 30″ S., long. 94° 05′ W.). Surface. Surface temp. 75° F. 31 December, 1904. One unusually slender specimen in four pieces.

Off the Galapagos Islands: Sta. 4721 (lat. 1° 47′ S., long. 19° 36′ W.).

Surface. Surface temp. 74° F. 11 January, 1905. One incomplete specimen taken.

Between the Galapagos and Paumotu Islands: Sta. 4726 (lat. 12° 30′ S., long. 111° 42′ W.). Surface temp. 78° F. 18 January, 1905. Several fragments, one exceptionally large, though lacking the head, taken at the surface.

Between the Galapagos and Paumotu Islands: Sta. 4727 (lat. 13° S., long. 112° 45′ W.). Surface temp. 77° F. 18 January, 1905. Fragments from surface.

Northeast of the Paumotus: Sta. 4734 (lat. 17° 36′ S., long. 122° 15′ W.). Surface. Surface temp. 81° F. 22 January, 1905. One large and nearly complete specimen.

This species, originally described from the Mediterranean, where it is well known, was also previously reported, by Apstein (1891), as occurring in the Pacific, off the coast of Chile. The specimens above recorded seem fully to conform to the published descriptions and figures. The form from the Hawaiian Islands described by Treadwell under the name *fuscopunctata* is probably identical with the present species. The specimen reported above from Sta. 4721 also has brown spots, but these are possibly chiefly due to preservation, while some of the specimens from Sta. 2682 are distinctly brown throughout, this also being due to preservation, as a specimen from the same station, but differently preserved, is colorless and translucent.

MAUITA, gen. nov.[1]

Prostomium with two very large eyes projecting laterad; five tentacles, an unpaired median dorsal one, and two pairs of short ones on the ventral side anteriorly.

Proboscis armed with two stout and long, non-chitinous, prehensorial processes which in the retracted condition of the proboscis protrude from the mouth.

The first two somites coalesced, the others free and distinct.

With three pairs of tentacular cirri, all ventral in position; two pairs upon the first segment (= somite I + somite II) and one pair upon the third.

True parapodia beginning upon the fourth somite. Parapodia lateral in position. All uniramous, represented by the neuropodium. Each terminated by a conspicuous cirrus-like process. Cirri conspicuous, the styles foliaceous.

A single aciculum in each parapodium, its tip free. Setae all composite, slender and numerous.

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[1] Polynesian *Maui*, a mythical hero.

Tissue of body dense, opaque, and well pigmented.

Pelagic in habits.

GENOTYPE.—*Mauita nans*, sp. nov.

This genus seems undoubtedly nearest to Vanadis Claparède. It is separated from that form because of the reduction of the first somite and its seemingly complete fusion with somite II. This reduction and fusion gives a very different appearance in ventral view. The strong development of the parapodia is a conspicuous feature.

MAUITA NANS, sp. nov.

Plate **24**, fig. 10, 11; Plate **25**, fig. 1–6.

No complete specimen is represented in the collection. An anterior fragment consisting of head and sixty-seven somites is 45 mm. long, with a maximum width, exclusive of the parapodia, of 3.25 mm., inclusive of the parapodia, of 5.5 mm., and to the tips of the setae near 8.3 mm. The width of the head across eyes is 3 mm. A fragment, lacking the head and caudal end, 64 mm. long, consists of seventy-seven somites; and a second similar fragment of the same length, but more slender, consists of one hundred and two somites.

The eyes are large and protruding, as usual, making up the principal bulk of the prostomium. The corneal surface of each is more convex and is directed outward and very sightly cephaloventrad. The caudal region of the prostomium between the eyes is elevated, forming a thick transverse ridge or isthmus between the eyes. In front of this isthmus the dorsal surface is abruptly and deeply depressed, and then maintains the same horizontal level to the anterior border, which extends straight across between the anterior edges of the eyes. From the caudal region of the depressed area a short rounded process, the median tentacle, projects forward; from its base a somewhat elevated, superficially flattened band, separated distinctly from the region each side, extends forward along the median line, bending about the anterior end and continuing back caudad along the ventral surface of the prostomium, this band narrowest across the anterior surface, and widening caudad both on the dorsal and on the ventral surface. The paired tentacles are invisible from above, being situated on the ventral surface and well removed from the anterior edge. They are small, short, and subconical. The posterior ones are decidedly closer together than the anterior ones, the bases of the four outlining a trapeziform area. Caudally the ventral surface of the head between the eyes is deeply depressed or excavated. (Plate **25**, fig. 3).

The prehensorial processes of the proboscis project conspicuously from the mouth in the type. Each is swollen proximally, but is elsewhere slender. Length near 3.7 mm. (Plate 25, fig. 2).

The first two somites are coalesced. The combined segment is short on the ventral side, where it is crossed longitudinally and sublongitudinally by numerous fine sulci. It widens laterally, extending forward on each side and coming in contact with the eye, thereby making the free anterior ventral border widely concave. Dorsally the segment is again short. On each side at the ventral level and close to the eye is borne the tentacular cirrus pertaining to the first somite. Caudad of this on each side is the cirrus of the second somite. This greatly exceeds the first one in size. It is flattened, the direction of the flattening being a little oblique to the longitudinal axis of the body, but the cirrus not so thin as the ordinary cirri; flat on the caudal surface, but somewhat convex on the anterior; in outline somewhat broadly linear lanceolate. The cirrophore is distinct, but short.

The third somite is wholly distinct from the contiguous ones. It is longer ventrally and dorsally than the preceding composite ring, but laterally it is decidedly shorter. Each third tentacular cirrus is attached a little farther mesad than the second one. It is decidedly smaller than the second, but longer than the first, is conical in form and has a distinct, short, and broad cirrophore. In the type the body is narrowest at the tenth somite from where it widens cephalad to the fourth somite and then is again somewhat constricted. It widens caudad to near the twenty fifth somite and thereafter is parallel-sided to near the end of the fragment. The two fragments that lack the prostomium and caudal somites are also parallel throughout. The somites are dorsally convexly arched. Each is typically divided above by a transverse sulcus into two primary divisions, each of which is again subdivided by weaker sulci into mostly two or three minor annuli. The venter shows a distinct neural furrow. The tenth somite is three times wider than long, the somites in the wider middle region of the body maintaining nearly the same proportion.

The fourth somite, very short like the preceding ones, bears parapodia represented chiefly by a large, foliaceous, broadly oblong or subovate dorsal cirrus with its distal end obliquely truncate. The neuropodium proper is a very slight tubercle. The style of the ventral cirrus is a foliaceous, rather broadly lanceolate, appendage attached to a short, rounded cirrophore that appears like a rounded tubercle when the style is lost. The parapodia of the fifth and succeeding somites are fully developed. In a typical parapodium of the anterior region the notocirrus has a short but thick cirrophore, with its vertical diameter greater than the horizontal one. Upon this is borne the large foliaceous style, which is subovate in outline with apex obtuse and directed ectad or a little ventrad of ectad. The styles of the neurocirri are smaller. They are shaped much like those of the notocirri, but are relatively narrower and distally more rounded. The neuropodia are cylindrical, distally subconically narrowed processes extending beyond the neurocirri. Each is terminated by a single, long, cirrus-like appendage, at the side of which the aciculum projects. Caudad the style of the notocirrus becomes longer and proportionately much broader. The style of the neurocirrus also becomes larger and more rounded, somewhat widely subreniform, with its longitudinal axis directed ectad. The edges of the styles are frequently irregular, and may be incised or even sublobate. The styles of the notocirri overlap each other and tend also to cover the neuropodia proximally, and often considerably overlap the neurocirri as well. (Plate **24**, fig. 11; Plate **25**, fig. 4–6).

In each neuropodium there is a single aciculum which is colorless. Proximally it is stout, but narrows to a slenderly acute tip which projects freely a distance about equal in length to the cirriform appendage, at the base of which it emerges. The setae are all transparent. They are of a single type, all being composite. They are long and numerous, forming a large, fan-shaped fascicle. The appendage of each seta is short, distally very fine, and usually more or less curved. (Plate **24**, fig. 10; Plate **25**, fig. 1).

The dorsum is light brown, paler on the anterior somites and between the eyes, the latter also paler, excepting the dorsal surface. The specimen from Sta. 4727 has a decidedly reddish cast. The venter is yellowish. The parapodia and cirri are lightest, white of a dilute yellow tinge. The segmental glands, showing dorsally at the base of each parapodium as a well-developed lobe and extending down the side caudad of the base of each parapodium, are colored deep purple-brown or almost black, thus forming a conspicuous series of strongly contrasted dark dots along each side as viewed from above. The ventral glands are small and pale.

LOCALITY. Between the Galapagos and Paumotu Islands: Sta. 4726 (lat. 12° 30′ S., long. 111° 42′ W.). Surface temp. 78° F. 18 January, 1905. Three incomplete specimens, of which only one has the anterior end complete.

Between the Galapagos and Paumotu Islands: Sta. 4727 (lat. 13° S., long. 112° 45′ W.). Surface temp. 77° F. 18 January, 1905. Two fragments of a specimen lacking both anterior and caudal ends.

HALODORA Greeff.

Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 55.
Nauphanta Greeff (*nec* Kinberg, 1864), *Op. cit.*, p. 69.
Greeffia McINTOSH, Challenger Annelida, 1885, p. 182; APSTEIN, Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 12.

HALODORA REYNAUDII (Audouin & Milne Edwards).

Ann. sci. nat., 1833, ser. **1**, **29**, p. 238, pl. 15; GREEFF, Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 55.
Nauphanta celox GREEFF, *Op. cit.*, p. 69, pl. 3, fig. 40–42, pl. 4, fig. 43–55.
Greeffia celox McINTOSH, Challenger Annelida, 1885, p. 183; APSTEIN, Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 12, pl. 2, fig. 10.

The specimens from Sta. 4652 vary in length from 28 to 34 mm. In a specimen 34 mm. long the greatest width, exclusive of the parapodia, is 3 mm.; inclusive of parapodia, without setae, 6.2 mm., and to tips of setae, near 8 mm. The number of somites in these specimens is mostly from forty-eight to fifty. The maximum width is near the fourteenth somite, from where the body narrows moderately cephalad and narrows continuously caudad, the posterior end being acutely pointed.

The general color of the body is greyish brown, most showing more or less distinctly narrow transverse stripes of darker brown, one on each somite extending between the opposite parapodia. There is also a dark, middorsal, longitudinal line. A more elevated area over each ventral ganglion appears somewhat paler. The cirri are also lighter in color. The dorsal segmental glands at the bases of the parapodia have their ectal fold very dark, appearing as a series of deep colored spots along each side. The ventral glands are pale, or may also be dark, and then form on each side a ventral series of dark dots. Dorsally, a dark spot may be present on the prostomium at the mesal edge of each eye. One specimen is lighter, more yellowish in color.

So far as can be judged, the structure of proboscis, eyes, and tentacles, as well as of the parapodia, appears to be typical, though, unfortunately, I have been unable to compare with Atlantic specimens. The tentacles seem to vary somewhat in relative and actual size. The cirriform appendages on the parapodia are conspicuous, tapering distally, with the two in each case equal or nearly so.

Two specimens from Sta. 3790 are accompanied by a field note to the effect that in life the dorsum is "cream with a transverse brown band on each segment. Parapodia cream yellow." The dark spot at base of each parapodium is also noted.

Two specimens from Sta. 4655 are also much lighter in color than those first noted above, yellow, but with the same markings, the black segmental organs showing very conspicuously. The larger specimen is only 25 mm. long, but its width is proportionately large, the maximum being 3 mm., or to the ends of the parapodia 7.7 mm.

The two individuals from Sta. 4669 are larger and decidedly more robust. The larger of the two is 45 mm. long; the maximum width, exclusive of the parapodia, is 3.5 mm. and inclusive of the parapodia, 7.8 mm., and to tips of the setae 10.75 mm. The number of somites is fifty-eight or sixty, the number given by Greeff (1876, p. 69) as typical of *celox*.

The two specimens from 4682 are large, like those from Sta. 4669, but are even more robust. One of them, exclusive of the protruded proboscis, is 45 mm. long, with a width, inclusive of parapodia, of 9 mm. and, inclusive of setae, of 11.5 mm., width exclusive of parapodia 4.4 mm. The extruded proboscis, the two long processes, 5.5 mm. long and 4.2 mm. thick at the widest part. The body is yellow, of a weakly brownish cast, the parapodia and cirri lighter; the usual markings present.

LOCALITIES. North of Marquesas Islands: Sta. 3790 (lat. 6° 25′ S., long. 138° 59′ W.). Surface. Surface temp. 80° F. 13 September, 1899. Two fragments.

Between Galapagos Islands and Peru: Sta. 4652 (lat. 5° 45′ S., long. 82° 40′ W.). Surface. 11 November, 1904. Eighteen specimens.

Off Peru: Sta. 4655 (lat. 5° 57′ 30″ S., long. 81° 50′ W.). Surface. 12 November, 1904. Two specimens.

Between Galapagos Islands and Peru: Sta. 4650 (lat. 5° 21′ S., long. 84° 39′ W.). Surface temp. 71° F. 10 November, 1904. A small and apparently young specimen taken at the surface.

Off Peru: Sta. 4657 (lat. 7° 12′ 30″ S., long. 84° 09′ W.). Surface. 13 November, 1904. Eleven specimens.

Off Peru: Sta. 4663 (lat. 11° 20′ S., long. 88° 55′ W.). 16 November, 1904. One specimen taken at surface.

Off Peru: Sta. 4665 (lat. 11° 45′ S., long. 86° 05′ W.). 17 November, 1904. One incomplete specimen, surface.

Off Peru: Sta. 4669 (lat. 12° 13′ S., long. 80° 24′ W.). 19 November, 1904. Two specimens taken at surface.

Between Peru and Easter Island: Sta. 4682 (lat. 19° 07′ 30″ S., long. 90° 10′ W.). 8 December, 1904. Two specimens at surface.

Galapagos, near Hood Island: Sta. 4715. 2 January, 1905. One broken specimen, of the dark-bodied type, with sharply contrasting parapodia.

CORYNOCEPHALUS Levinsen.

Kongl. Danske vidensk. sselsk. Skrifter naturvid. math., 1885–86, **3**, p. 327; Apstein, Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p 14.

Of this genus one species, which is new, was secured, making the fourth known. It may be placed by means of the following key:

Key to Species.

a. Somites distinctly bipartite on ventral side.........................*C. albomaculatus* Levinsen.
aa. Somites ventrally entire.
  b. Axes of eyes meeting at a right angle....................................*C. tenuis* Apstein.
  bb. Axes of eyes forming a straight transverse line.
    c. Median tentacle blunt, attached far in front of axes of eyes...........*C. paumotanus*, sp. nov.
    cc. Median tentacle slender, attached at or caudad of level of axes of eyes....*C. gazellae* Apstein.

CORYNOCEPHALUS PAUMOTANUS, sp. nov.

Plate **23**, fig. 1–3.

The body at present is a dilute yellowish, excepting the segmental glands, which are dark purplish brown; the eyes are also darker than the general body and of a somewhat orange cast.

The body consists of fifty somites in addition to the prostomium. The total length is 28 mm. The greatest width, exclusive of the parapodia, is 2 mm., and, inclusive of the parapodia, 3.7 mm. The body is flattened dorsoventrally. It is widest in the middle region, from which it narrows to a point at the caudal end, and also narrows strongly cephalad, the first somites being abruptly much narrower than the prostomium, inclusive of the eyes.

The prostomium is elevated between the eyes like a short half cylinder placed transversely. A low, subconical projection on its anterior face represents the median tentacle. In front of this elevated region is a depressed, subquadrate lobe projecting in front of the eyes; the anterior corners are rounded and the anterior margin is mesally a little incurved. This lobe projects broadly ventrad of the general level and its plain ventral surface bears the four paired tentacles. The paired tentacles are large, flattened, lanceolate, foliaceous structures, of which the posterior pair are the larger. On the anterior edge at the base of each is a small dark spot. The eyes are large and project prominently laterad, their axes lying in a common straight, transverse line. (Plate **23**, fig. 1, 2).

Except at the extreme ends of the body, the somites are of nearly uniform length. In the wide middle region they are about three and a third times wider than long. The somites are but weakly convex and are nearly equally so dorsally and ventrally. Ventrally there is a weak neural furrow, and the somites are entire, or at most show but a vague transverse furrow on each side mesad of parapodia. The anterior margin of the first somite ventrally, which borders the mouth, is straight, and the border immediately caudad of the mouth slopes caudoventrad to the general level. (Plate 23, fig. 2).

There is a ventral glandular papilla at the base of each parapodium of somites XII to XVI in the paratype. These are long, cylindroconical, and conspicuous. In the type they are thicker and lower.

There are five pairs of tentacular cirri, or rather six, counting the ventral cirri of the fourth somite, of which one pair is borne on the first somite and two pairs each on the second and third somite. The cirri of the first somite are the neurocirri; they are conical and of moderate length, extending outward a little beyond the base of the ocular lens. The ventral tentacular cirri of the second somite are similar in form and size to those of the first, while the ventral ones of the third somite are smaller, though maintaining the conical form. The dorsal tentacular cirri of the second and third somites are much larger than the others and are subequal in length; they extend ectad distinctly beyond the outer edge of the eyes, are gradually tapered from the base to an acute tip, and are a little flattened. (Plate 23, fig. 1, 2).

On the fourth somite the dorsal cirri of the parapodia are short, ovate, and strictly foliaceous; the neurocirri are subconical, scarcely flattened, of nearly same form and size as the ventral tentacular cirri of the third somite, as a sixth pair of which they might be regarded. No setae could be detected on this somite. The parapodia of the fifth somite are setigerous; the setigerous lobe or neuropodium is distally rounded, showing no trace of a process, and bearing a series of four or five stout setae of the crochet-type with but two or three of the five capillary setae on the dorsal side; the neurocirrus is foliaceous and broadly attached to the neuropodium, its distal end scarcely free and not attaining end of neuropodium; the notocirrus exceeds the neuropodium. In succeeding parapodia the number of crochets increases to about seven and gradually toward the caudal region the capillary setae increase in number, and posteriorly are very numerous. In general the notocirri are large and overlap; in the anterior region they are broad, somewhat ovate-reniform, and auriculate at base. Farther caudad they appear relatively broader, but are always angulate at the distal end. Caudad the neurocirri become much larger and extend beyond the neuropodium with the distal end free; they are typically of a broadly sublanceolate form, with the apex often prolonged. (Plate **23**, fig. 4).

Localities. Paumotu Islands: Sta. 3691 (lat. 18° 55′ S., long. 146° 32′ W.). Surface temp. 78° F. 4 November, 1899. One specimen taken at 100 fms. to surface.

Off Peru: Sta. 4671 (lat. 12° 07′ S., long. 78° 28′ W.). Surface temp. 66° F. 20 November, 1904. Three specimens.

Between Callao, Peru and Easter Islands: Sta. 4679 (lat. 17° 26′, long. 86° 46′ W.). 300 fms. to surface. Surface temp. 69° F. 7 December, 1904. The anterior end of a single very small specimen.

This species in having the axis of the eyes strictly transverse agrees with *albomaculatus* Levinsen and *gazellae* Apstein. It differs from the former in the form of the cirri and especially in having the somites ventrally entire instead of conspicuously bipartite. From *gazellae* it differs in the position and form of the median tentacle, this being attached much in front of the axis of the eyes instead of somewhat caudad of this level; in the much larger, more foliaceous, and more ventrally placed paired tentacles; strikingly in the form and position of the tentacular cirri; and decidedly in the form of the styles of the notocirri.

PLOTOHELMIS, gen. nov.[1]

Rhynchonerella Greeff (*nec* Costa), Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 74; Apstein (*nec* Costa), Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 15.

Body depressed, slender, tapered caudad, relatively long. Eyes very large. Tentacles fine. Prostomium projecting conspicuously forward beyond the eyes. Five pairs of tentacular cirri, of which two pairs are reduced in size. Parapodia uniramous. Both ventral and dorsal cirri large and foliaceous. Neuropodia without terminal appendages. Setae of two types, simple coarse ones and finer, capillary, composite ones.

Genotype.—*P. alata*, sp. nov.

Rhynchonerella was established by Costa with his species *gracilis* manifestly the type. Subsequently *R. capitata* Greeff, *R. longissima* Levinsen, and *R. fulgens* Greeff were referred to the genus, Greeff's two species later proving to be identical. Costa's species is now known to be identical with Greeff's *nasuta*, the type of his genus Callizona, which must accordingly fall as a synonym of

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[1] πλωτός, floating, ἕλμις worm.

Rhynchonerella, which must follow its type-species. Greeff's species *capitata* (= *fulgens*), though apparently without a genus, is without doubt fully congeneric with *Plotohelmis alata*, sp. nov. *Rhynchonerella longissima* of Levinsen, as genera are now accepted, stands as *Vanadis longissima* (Levinsen).

PLOTOHELMIS ALATA, sp. nov.[1]

Plate **23**, fig. 4–10; Plate **24**, fig. 1–3.

The general color of the body at present is somewhat ferruginous, paler caudad. The parapodia and cirri are pale yellow.

The body is long and thread-like, narrowing caudad and becoming very slender or fine in the posterior region. Two fragments, apparently together forming one complete specimen, have a total length of approximately 56 mm. At present the maximum diameter, exclusive of parapodia, is only about .5 mm., but as the specimen has manifestly undergone shrinkage as though from drying, the width in life was probably considerably greater. The width, inclusive of the parapodia, is 2.4 mm., and to the tips of the setae, 3.4 mm., the parapodia at present thus materially exceeding the width of the somite. In the anterior fragment of the type, which is 12 mm. long, the number of somites is thirty-nine, in the posterior piece one hundred and thirty-five, or near that number, making the total the exceptional number of one hundred and seventy-four.

The prostomium projects forward in front of the level of the eyes as an anteriorly pointed, subpyramidal process, from the sides of which project the tentacles. The tentacles are proximally stout and conically pointed, the lower ones attached somewhat on the ventral surface and a little farther caudad than the dorsal ones, than which they are somewhat longer. The median tentacle is a much more slender and shorter, distally pointed, process arising at the caudal edge of a depression in front of the elevated portion of the prostomium between the eyes; it projects directly forwards. Eyes large, dorsally elevated. (Plate **23**, fig. 4, 5). The proboscis of the paratype is long and smooth, and bears about the opening a series of pointed papillae, the precise number of which could not be made out, but it is six or more.

The four, or five, depending on interpretations, pairs of tentacular cirri are attached one pair on the first somite and two pairs each on the two following. The first tentacular cirri are cylindrical, narrowing distad to a point, and are but little smaller than the dorsal tentacular cirri of the following two pairs; they are similar in form and have distinct cirrophores narrower than the cirri immediately distad of them. The ventral tentacular cirri of the second somite are very small and are conical in form. The ventral cirri of the third somite are similarly much reduced, but they are thin and foliaceous, more like a typical neurocirrus, excepting for minute size. (Plate **23**, fig. 5).

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[1] alatus, winged.

A normal pair of parapodia are borne on the fourth somite, the cirri being large and foliaceous, though the neuropodium is rather small. In a typical parapodium, as from near the thirty fifth somite of the body, the neuropodium is long and cylindrical, distally pointed, and drawn out into a finely pointed process through which the aciculum extends. The notocirrus arises from a prominent cirrophore attached at the very base of the parapodium. It is normally elliptic or oblong-elliptic, and distally somewhat more pointed. The neurocirrus is attached on the ventral surface but little farther distad than the notocirrus. It is similarly shaped but smaller. Both cirri extend beyond the distal end of the neuropodium, the notocirrus surpassing it by a considerable distance. Forward from this region the notocirri become broader and broader, at first becoming more broadly elliptical acute, then broadly ovate and distally more rounded, and finally on the most anterior ones nearly circular in general outline. The neurocirri similarly become much broader in the anterior region. Caudad the cirri change less, but trend more toward a sublanceolate form. (Plate **23**, fig. 6–10; Plate **24**, fig. 1–3).

The anterior neuropodia bear each a series of stouter simple setae; these are moderately long, a little curved, and are transparent. Caudad they become reduced in number, finally only one, in a ventral position, being as a rule present, the capillary composite setae in the meantime having become numerous. The composite capillary setae in a typical parapodium are numerous, long, and unusually fine; they are soft and flexible, being commonly wavy and even curled, like strands of fine silk. The distal piece in each composite seta is at base a little thinner than the adjacent part of the shaft, narrowing distad to a fine point.

LOCALITY. Between Lower California and the Marquesas Islands: Sta. 3, Agassiz serial no. (lat. 26° 18′ N., long. 128° 54′ W.). Surface. 28 August, 1899. Two specimens.

This species greatly exceeds *capitata* (Greeff) in size (56 mm. against 8 mm. given by Greeff for the length of his typical specimen). As judged from Apstein's figure (Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., pl. 2, fig. 19) the tentacles of *capitata* are proportionately more slender; the first tentacular cirri are relatively much smaller and the dorsal tentacular cirri of the third somite decidedly longer while the ventral cirri of the same somite are cylindrical and truly tentacular instead of thin and foliaceous. The notocirri and neurocirri of parapodia in the middle region of the body are relatively to their lengths much broader, and the difference in size between notocirrus and neurocirrus of a given parapodium is less.

Rhynchonerella A. Costa.

Ann. Mus. zool. Univ. Napoli, 1862, **2**, p. 168; Greeff (ad. part. *gracilis*), Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 57.

Callizona Greeff, *Ibid.*, p. 56; Apstein, Ergebn. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 16.

Key to Species.

- *a.* One pair of tentacular cirri much exceeding the others in length.......... *R. cincinnata* (Greeff).
- *aa.* One pair of tentacular cirri not thus much exceeding the others.
  - *b.* Two pairs of tentacular cirri (on somites II and III) subequal and clearly longer than the others.
    - *c.* The first parapodia with more than two stout setae.
      - *d.* The stout setae simple.
        - *e.* Notocirri of first parapodia not longer than the others............ *R. möbii* (Apstein).
        - *ee.* These notocirri longer than any others........................ *R. melanopthalma* (Greeff).
      - *dd.* The stout setae composite.
        - *e.* The appendage of the stout setae robust and serrate................ *R. setosa* (Greeff).
        - *ee.* The appendage of the stout setae fine and smooth.
          - *f.* Stout setae of first parapodium twelve; lower paired tentacles slender, not unusually enlarged; notocirri not attaining ends of neuropodium, distally rounded. *R. grubei* (Greeff).
          - *ff.* Stout setae of first parapodia four; lower paired tentacles greatly thickened; notocirri always surpassing the neuropodia, their tips acute.......... *R. pycnocera*, sp. nov.
    - *cc.* The first parapodia with only one or two stout setae.
      - *d.* Cephalic tubercle very large; stout setae simple..................... *R. gracilis* Costa.
      - *dd.* Cephalic tubercle moderate in size, or small.
        - *e.* Anterior neurocirri broadly ovate, distally rounded; stout setae composite; body plump. *R. angelini* (Kinberg).
        - *ee.* Anterior neurocirri narrow.
          - *f.* Notocirri of middle somites cordate; dorsal tentacular cirri of third somite longer than those of the second; stout setae simple......................... *R. henseni* (Apstein).
          - *ff.* Notocirri of median region narrowly elliptoacute to ovate-lanceolate; dorsal tentacular cirri of somites II and III equal in length....................... *R. parva*, sp. nov.
  - *bb.* The tentacular cirri gradually increasing in length from the first to the third pair. *R. japonica* (Izuka).

Rhynchonerella cincinnata (Greeff).

Callizona cincinnata Greeff, Nova acta Acad. Caesareae Leop.-Carol., 1876, **39**, p. 71, pl. 5, fig. 56–59; Apstein, Ergenb. Atlant. Ocean * * * Plankton-exped., 1900, **2**, H. b., p. 16.

This species has been previously known only from the type-specimen which was taken at the Canary Islands. The specimens here recorded are smaller than the type, though none is wholly complete. A fragment about 10 mm. long (Sta. 4588) consists of sixty-one somites. This is a very slender species characterized especially by the long posterior tentacular cirri, this pair much exceeding the others. The axes of the eyes meet at a considerable angle, the lenses being directed cephalad of directly ectad. In most of the specimens the proboscis is protruded; this is short and regularly cylindrical, with its surface uniformly roughened with small granular elevations; about thirteen small tubercles about the opening.

Localities. Off Southwest Coast of Mexico: Sta. 4588 (lat. 19° 52′ N., 106° 02′ W.) Surface. Surface temp. 81° F. 12 October, 1904. Several broken specimens.

Off Southwest Coast of Mexico: Sta. 4598 (lat. 15° 58′ N., 98° 13′ W.). Surface. Surface temp. 84° F. 15 October, 1904.

Off Southwest Coast of Mexico: Sta. 4600 (lat. 15° 36′ N., long. 96° 59′ W.). Surface. Surface temp. 82° F. 15 October, 1904. One broken specimen taken.

Off Central America: Sta. 4613 (lat. 9° 43′ N., long. 86° 15′ W.). 300 fms. to surface. Surface temp. 80° F. 19 October, 1904. One specimen.

Off Peru: Sta. 4663 (lat. 11° 20′ S., long. 88° 55′ W.). Surface. Surface temp. 69° F. 16 November, 1904. One specimen.

Between Peru and Easter Island: Sta. 4689 (lat. 24° 05′ S., long. 100° 20′ W.). 300 fms. to surface. Surface temp. 72° F. 12 December, 1904.

Between Easter Island and the Galapagos: Sta. 4702 (lat. 18° 40′ S., long. 102° W.). 300 fms. to surface. Surface temp. 73° F.

Between Easter Island and the Galapagos: Sta. 4708 (lat. 11° 40′ S., long. 96° 55′ W.). Surface. Surface temp. 72° F. 29 December, 1904. Two fragments taken.

Rhynchonerella pycnocera, sp. nov.[1]

Plate **25**, fig. 7, 8; Plate **26**, fig. 1–6.

The general color at present is brownish, with the parapodia paler. The segmental glands in full color are deep purplish, but some are only irregularly pigmented. In the type they are most deeply and solidly colored on somites near the thirty fifth. The eyes dorsally, the prostomial elevation, the base of the median tentacle, and the ventral paired tentacles are colored, though irregularly and not solidly, with a similar dark pigment. Some dark pigment is also more lightly distributed over the tentacular cirri and some of the anterior parapodial cirri.

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[1] *πυκνὸς*, thick, and *κέρας*, horn, tentacle.

The type-specimen is complete, excepting the absence of a few somites at the caudal end. Exclusive of the protruded proboscis, it is 22 mm. long. The maximum width, exclusive of the parapodia, is 1.6 mm.; inclusive of parapodia proper, 3.6 mm., and to the tips of the setae, 5.2 mm. The number of somites present is seventy-two. The body is widest near the eighteenth somite, caudad of which across the middle region of the body it narrows gradually and then over the following portion more decidedly, the posterior region becoming slender. The body is compressed dorsoventrally.

The prostomium protrudes forward conspicuously beyond the eyes and rises dorsad as a high, rounded, subhemispherical, darkened tubercle from which the paired tentacles arise laterally. The tentacles of dorsal pair are broken off; but, judging from the scars, they must have been thick like the ventral ones. Each ventral paired tentacle arises from the ventral surface of the tubercle at the anteroectal corner, farther forward than the corresponding dorsal one; it is subconical, distally rounded, and proportionately very thick. The median tentacle is a short, subconical, somewhat laterally compressed body standing erect immediately caudad of the tubercle. The prostomium between the eyes from where the median tentacle arises is uniformly depressed, not at all elevated over the axis between the eye centres. The eyes are large, protruding very prominently above the level of the anterior somites, as well as laterad; in each the lens is directed moderately cephalodorsad of directly ectad. The proboscis as protruded is 1 mm. long and 1.2 mm. thick a little above the base, where widest, being constricted at base and also distad. (Plate 26, fig. 1).

The labium protrudes moderately ventrad; its anterior margin is gently widely convex on each side, the margins of the two sides meeting at the middle line in a very obtuse angle. There are five pairs of tentacular cirri, of which one pair, as usual, pertain to the first somite, and two pairs to each of the two succeeding somites. The dorsal cirri of the second and third somites are equal or nearly so and much exceed the others. The tentacular cirri of the first somite are but slightly larger than the ventral cirri of the next two; they are conical in form, and a little constricted between middle and tip; the cirrophore is short and narrower than the style at its widest part. The longer cirri are cylindroconical. (Plate 26, fig. 1, 2).

The somites are compressed dorsoventrally, the dorsal and ventral arch being equal and low. The anterior somites are very short. The others increase in length to the middle region of the body. The length of the sixth or seventh somite is only near half that of those near the twenty eighth, in which region the width is from three to three and a third times the length. In the posterior region the somites continue of the same actual length as those of the middle region, the relative length, however, being thus much greater. The segmental organs first appear distinctly on the fifteenth somite, though on a few in front of this they occur in a very rudimentary condition. They increase in size to the middle region and gradually and but moderately decrease again in the caudal region.

The neuropodia in general are slenderly conical in form and long, the most anterior ones, however, being much shortened. Each ends in a slender, distally pointed appendage. The styles of the cirri are foliaceous and large like those of Phyllodocidae. The notocirri have the cirrophores conspicuously large and swollen. They are attached above at the base of the parapodium. The styles of the anterior notocirri are broadly ovate, with apices acute. Caudad toward the middle region they increase considerably in size and are proportionately to the width somewhat longer. In the posterior region they become much smaller. In all cases they extend beyond the distal end of the neuropodium; and in the anterior and middle regions particularly are strongly imbricated. The anterior neurocirri are ovate, acute; they are smaller than the corresponding notocirri, but extend similarly beyond the neuropodia. In the middle region the neurocirri are more slender than the notocirri, being broadly lanceolate or oblong-lanceolate in outline. In the posterior region they become reduced in correspondence with the notocirri, but still attain or extend beyond the tip of the neuropodium. (Plate **25**, fig. 7, 8; Plate **26**, fig. 3, 4).

The setae of the first parapodium are of two kinds, a stouter and a more slender type, there being in the specimen studied four of the former and six of the latter. Both types of setae are composite. The stout ones are slightly doubly curved, with the acute tip of the shaft directed to one side. The terminal appendage is very fine. The slender setae are longer than the others, and their appendage is also longer. Caudad the number of stout setae becomes reduced normally to two or one. The slender ones at the same time increase greatly in number and length. (Plate **26**, fig. 5, 6).

Locality. Between Peru and Easter Island: Sta. 4683 (lat. 20° 02′ 30″ S., long. 91° 52′ 30″ W.). 300 fms. to surface. Surface temp. 70° F. 9 December, 1904. One specimen.

This species is probably nearest to *R. grubei* (Greeff), with which it agrees in bearing more than two setae of the stout composite kind on the first parapodia, with the distal appendage of these setae fine. It differs clearly, however, in having but four stout setae instead of twelve on the first parapodia, the others being more slender; in the different form and greater proportionate size of notocirri and neurocirri, these exceeding the neuropodium instead of falling short of its tip (as shown by Greeff's figures); and conspicuously in the much stouter ventral paired tentacles.

RHYNCHONERELLA PARVA, sp. nov.[1]

Plate 25, fig. 9, 10.

The general color is yellow, more dilute in the appendages, which are translucent.

The type-fragment, consisting of head and twenty-five somites, is 3 mm. long. The body, so far as represented in the type, varies but slightly in diameter, being, however, a little narrowest at the anterior end just back of the eyes and widening to near the fifteenth somite, after which there is no change.

The prostomium projects usually in front of the eyes as a rounded tubercle from which the slenderly conical tentacles arise. The median tentacle is a small, slender process arising above between the eyes at the caudal end of a depression. The eyes are widely separated; the lenses are directed a little forward of directly ectad.

There are five pairs of tentacular cirri arising from the first three somites, one pair on the first (neurocirri) and two pairs on each of the two following. The first cirri do not reach the outer edge of the eyes, but the dorsal cirri of the next two somites, which are decidedly longer and are subequal, extend clearly beyond the outer limit of the eyes. The ventral cirri of somites II and III are short.

The uniramous parapodia have the setigerous branch or neuropodium long, a little swollen at base, these cylindrical over most of length and conically narrowed distally, with the tip a slenderly pointed process through which the aciculum extends, and in addition bearing a single short appendage of the usual type. The notocirri of the posterior region of the fragment have a distinct cirrophore, bearing a lanceolate or narrowly ovate-lanceolate style. Forward the styles decrease in size, but remain proportionately narrow and acutely pointed.

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[1] parvus, small.

The neurocirri in the posterior somites are lanceolate and uniformly decidedly smaller than the notocirri; in the anterior somites they become much narrower and less foliaceous, appearing somewhat tentacular in form though still thinner in one diameter. (Plate 25, fig. 9, 10).

The composite setae have the appendages very long and fine at the tip, the base being nearly as broad as the shaft, though relatively narrower than in *angelini*. There seems normally to be a single stout seta in each parapodium. Most of these are broken off and it was impossible to be wholly certain as to the presence of an appendage.

LOCALITY. Between California and the Hawaiian Islands, nearer to the former: Sta. 3681 (lat. 28° 23′ N., long. 126′ 57′ W.). 100 fms. to surface. Surface temp. 66° F. 27 August, 1899. One specimen.

This form seems to approach *R. angelini* (Kinberg), described originally from the Pacific off the Coast of China. It is, however, conspicuously different in the form of the anterior notocirri in particular, these remaining narrow and becoming small instead of becoming conspicuously broader and broadly rounded. The appendages of the composite setae appear relatively much longer and more slender. Omitting consideration of the coarse setae, the present species may be distinguished from *R. henseni* Apstein by its narrower notocirri, and from *R. gracilis* Costa (= *R. nasuta* (Greeff)) by its much smaller prostomial tubercle.

TYPHLOSCOLECIDAE.

These are all small and exclusively pelagic forms in which the body is nearly colorless and transparent. The length of the body is mostly between 2.5 mm. and 15 mm., rarely as much as 32 mm. The number of somites is small, being from sixteen to fifty.

Prostomium fused with the peristomium to form a single division or "head" which is drawn out into a conical or rostrate form and bears a single median process or tentacle, which may be set off by a distinct articulation or not, and a pair, or two, of lateral foliaceous cirri. Dorsal and ventral surfaces often much extended into lappet-like processes or expansions, which may bear conspicuous ciliary processes.

In most, nuchal organs have not been detected, but in some they are strongly developed.

The parapodia are uniramous and small, or rudimentary, and bear each a single aciculum and two, or but few, simple curving setae. The cirri are strongly flattened, foliaceous, and are attached to the surface of the somite above and below the parapodia at or near the middle of their flat surface much as with true elytra. The cirri contain strongly developed and characteristic glands which decrease in number caudad and which contain peculiar rod-like bodies (possibly sensory nerve endings).

Anal cirri two, commonly foliaceous.

Alimentary canal presenting three divisions, pharynx, glandular stomach, and intestine proper; above the anterior region of the alimentary tract lies a highly characteristic diverticulum opening at the edge of the mouth, the so-called "retort-formed organ" which is capable of protrusion either alone or in conjunction with the proboscis.

Sexes separate. Development direct, without ciliated larval stages.

This is an aberrant and small family of which but few species have been recorded, these coming almost wholly heretofore from the Atlantic Ocean. Reibisch (Ergebn. Atlant. Ocean * * * Plankton-exped., 1895, **2**, H. c., p. 43–59) lists six species.

The ALBATROSS collection from the Pacific represents five species of which two are new and constitute a very interesting new genus noteworthy for the remarkably developed nuchal organs.

Key to Genera.

- *a.* With nineteen or more somites; head with a single pair of cirri.
  - *b.* First free somite bearing dorsally a strongly developed pair of branchiform nuchal organs. *Plotobia*, gen. nov.
  - *bb.* First free somite with no such organs evident.
    - *c.* Prostomium bearing a crown of flagella.................................*Typhloscolex* Busch.
    - *cc.* Prostomium without flagella.
      - *d.* Tentacle abruptly set off from the prostomium; on the dorsal side of head a prominent bipartite lobe flanked on each side by a ridge.....................*Travisiopsis* Levinsen.
      - *dd.* Tentacle not abruptly set off, gradually widening into the prostomium, of which it appears as a simple prolongation; no such bipartite prominence on dorsal side of the prostomium. *Sagitella* Wagner.
- *aa.* Somites sixteen; head with two pairs of foliaceous cirri..............*Typhlodrilus* Baldasseroni.

TYPHLOSCOLEX Busch.

Beobach. anat. entwicke. wirbellosen seethiere, 1851, p. 115; REIBISCH, Ergebn. Atlant. Ocean * * * Plankton-exped., 1895, **2**, H. c., p. 51.

TYPHLOSCOLEX MÜLLERII Busch.

Beobach anat. entwickl. wirbellosen seethiere, 1851, p. 663; REIBISCH, Ergebn. Atlant. Ocean * * * Plankton-exped., 1895, **2**, H. c., p. 52.

Sagitella kowalewskii form B, N. WAGNER, Trav. Soc. nat. St. Pétersb., 1872, **3**, p. 344.

?*Sagitella bobretzkii* N. Wagner, *Op. cit.*, 1872, **3**, p. 344.
Sagitella barbata Uljanin, Archiv. zool. exper., 1878, **8**, p. 6, pl. 1, fig. 2.
?*Sagitella praecox* Uljanin, *Op. cit.*, 1878, **8**, p. 8, pl. 1, fig. 3.
Acicularia virchowii Greeff, Zeitsch. wiss. zool., 1879, **32**, p. 244.

This species is very widespread in the warmer regions of the Atlantic and Indian Oceans and their arms, and will probably be found to be equally common in the Pacific. However, in the present collection the species is represented only by a single specimen 4 mm. in length. It seems fully to agree with the forms taken in other regions.

Locality. Gilbert Islands: off Arnho Reef. Surface by night light. 21 January, 1900.

Sagitella N. Wagner.

Trav. Soc. nat. St. Pétersb., 1872, **3**, p. 344; Reibisch, Ergebn. Atlant. Ocean * * * Plankton-exped., 1895, **2**, H. c., p. 51.
Acicularia Langerhans, Monatsb. K. akad. wissens. Berlin, 1877, p. 727; Greeff, Zeitschr. wiss. zool., 1879, **32**, p. 237.

Sagitella kowalewskii N. Wagner.

Sagitella kowalewskii form a N. Wagner, Trav. Soc. nat. St. Pétersb., 1872, **3**, p. 344; Uljanin, Archiv. zool. exper., 1878, **8**, p. 4, pl. 1, fig. 1; Reibisch, Ergebn. Atlant. Ocean * * * Plankton-exped., 1895, **2**, H. c., p. 56.
Acicularia virchowii Langerhans, Monatsb. K. akad. wissens. Berlin, 1877, p. 727; Greeff, Zeitschr. wiss. zool., 1879, **32**, p. 237, pl. 13, fig. 1–18.

A single much rubbed specimen seems to conform to this species, the only one so far recorded in the genus. It is the largest specimen so far reported, having a length of 17 mm., though composed of only nearly forty-three somites, whereas Reibisch found fifty in a specimen from the Atlantic 15 mm. in length. The number is usually under forty. The slender fusiform body has the usual transparent, glass-like appearance. One cirrus, with edges rolled in the typical way, is present on the head, but all others are lost. As seems to be normal in fully grown specimens, the parapodia are but slightly developed excepting in the caudal region.

Locality. About halfway between the Galapagos and the Paumotu Group (Manga Reva): Sta. 4728 (lat. 13° 47′ 30″ S., long. 114° 22′ W.). 300 fms. to surface. Surface temp. 77° F. 19 January, 1905. One specimen.

Sagitella sp. a.

A very small specimen 4.5 mm. long has the characteristically slender and glass-like, transparent body of *S. kowalewskii* N. Wagner. It is not in condition for detailed description or comparison. The conical head ends in a short transparent tubercle, which is not abruptly set off. The anal cirri are large and leaf-like, broader than represented by figures of *kowalewskii,* and particularly for young specimens in which these structures are commonly much reduced. Nearly all of the cirri have been rubbed off. The number of somites is small, and the specimen is probably not mature.

LOCALITY. Off Cape San Lazaro, Lower California: Sta. 4580 (lat. 24° 55′ N., long. 112° 45′ W.). 300 fms. to surface. Surface temp. 76° F. 10 October, 1904. One specimen.

PLOTOBIA, gen. nov.[1]

Prostomium conical. Tentacle short, but sharply distinct from the prostomium, though the latter narrows conspicuously forward to the base of the tentacle. Without definite flagella-bearing ridges. Bearing the usual pair of foliaceous cirri, these pertaining apparently to the peristomium, which is almost completely fused above with the prostomium.

The first free somite bearing a middorsal prominence, on each side of which is a branchiform appendage which may be either simple and cirriform or conspicuously branched. In addition this somite and the second one bear each a single pair of foliaceous cirri.

From the third free somite caudad both dorsal and ventral foliaceous cirri are present, there widely separated, with midway between them the setigerous lobe.

The number of somites twenty-one. Length up to 32 mm.

GENOTYPE.— *Plotobia coniceps,* sp. nov.

This seems nearer to Sagitella than to any other of the three previously known genera. The possession of the branchiform nuchal appendages on the first somite seems clearly to separate it from this as well as from the other genera. In the literature pertaining to those species not seen by me I find no mention of structures comparable to these. Plotobia is like Sagitella in the characteristically conical form of the prostomium and in having the setae begin on the third free somite (morphologically the fourth); aside from the possession of the branchiform organs, it differs, *e.g.*, in the more limited number of somites and in the more abrupt separation of the tentacle.

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[1] πλωτός, floating, and βίος, life.

PLOTOBIA SIMPLEX, sp. nov.[1]

Plate 65, fig. 6–11; Plate 66, fig. 1.

The body throughout is colorless and translucent.

The total length of the type is 9 mm., with a maximum width of 2 mm. A paratype from Sta. 4740 is 10 mm. long, and one from Sta. 4722 is 12 mm. long. The number of somites is twenty-one. The body as a whole is somewhat clavate in form, widening from a narrow caudal end forwards, but rounding in toward the small head anteriorly.

The prostomium is small in size and strictly conical in form, with the apex dorsad. The tentacle seems to be partly lost in the type, in which it is represented only by a small, more transparent, spherical appendage at the tip of the prostomium. The cirrus attached on each side at the base of the head is a broad, suborbicular, foliaceous structure completely covering the prostomium in lateral view. (Plate 66, fig. 1).

The lower lip is thickened and bulges ventrad. From the inner edges of the mouth there extends a semitransparent membrane continuous across the ventral side and bending dorsad about the ends, so that its edges nearly meet above, thus forming an incomplete funnel.

The middorsal prominence attributed to the first free somite is rather small, rounded, hemispherical. The branchiform process on each side arises close to the base of the head; it is widest at the base, above which it narrows strongly to the middle of the length and then but slightly distad to the rounded tip; it is flattened dorsoventrally. (Plate 66, fig. 1).

The single cirrus on each side of the first free somite is large, subquadrate, attached broadly at one side. Each cirrus of the succeeding somite is larger and more semicircular in outline. (Plate 66, fig. 1).

The somites beginning with the third postcephalic one bear each two pairs of well-separated cirri. Of these the notocirri increase caudad in size for several somites and become more circular or sometimes subreniform in outline, but with the distal end a little angularly extended. The neurocirri are smaller than the notocirri. The first one is somewhat semicircular in general outline, but presents a bulging rounded lobe dorsally and ventrally. The typical form of neurocirrus as occurring farther caudad is ovate-acuminate with a broad base which is lobed on each side, and so often appearing sagittate. (Plate 65, fig. 6–11).

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[1] simplex, simple.

While their bases are well separated, the expanded styles of neurocirrus and notocirrus on each side of each somite often nearly or quite meet. The parapodia proper are low, scarcely convexly elevated. Each bears two setae as usual, these being simple, slightly curved, and acutely pointed.

The somites are all simple, entire, not separated by deep furrows, and smooth. The pygidium is short and blunt. No anal cirri are *in situ* in the type.

Localities. Between the Galapagos and Paumotu Islands: Sta. 4722 (lat. 9° 31′ S., long. 106° 30′ W.). 300 fms. to surface. Surface temp. 75° F. 16 January, 1905. Two specimens.

Between the Galapagos and Paumotu Islands: Sta. 4724 (lat. 11° 13′ 30″ S., long. 109° 29′ W.). 300 fms. to surface. Surface temp. 77° F. 17 January, 1905. One specimen.

Toward the Paumotus: Sta. 4740 (lat. 9° 02′ S., long. 123° 20′ W.). Surface temp. 81° F. 11 February, 1905. One specimen.

Plotobia coniceps, sp. nov.[1]

Plate 66, fig. 2–4.

The body is typically but faintly tinged with brown, probably due to preservation, and is translucent and probably transparent in life. Two paratypes, however, are a much darker brown and somewhat dusky, with a paler mid-dorsal line.

The type is 32 mm. long with a maximum width of 3.25 mm. The smallest specimen is 14 mm. long. The specimen from Sta. 4711 is but 10 mm. long and is slender and translucent. The number of somites is twenty-one or twenty-two inclusive of the peristomium. The body is somewhat fusiform, narrowing from the middle conspicuously and about equally toward both ends.

The prostomium is strictly conical in form with its axis extending cephalodorsad in the type but more longitudinally in the large paratype from Sta. 4661. It is denser and darker than the rest of the body. Its apex is slightly bluntly rounded and bears the abruptly much more slender, very gradually acuminate, colorless tentacle. The tentacle is very short, equalling or a little exceeding the radius of a section of the prostomium the length of the tentacle from apex. The cirri are lost, but the scars at the base of the head are prominent. The lower lip is prominent, smooth, with its anterior edge convex. The retort organ in the type protrudes conspicuously, presenting a disc-shaped base, on the middle of which is borne a cylindrical, flat-topped eminence. In a paratype from Sta. 4661 the retort-organ is not fully protruded, a fold of it extending out as a frill. (Plate **66**, fig. 2, 3).

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[1] κωνικός, conical, -ceps, head.

The second somite has an anterior division above more elevated and continuous with head. From the posterior surface of this portion the median lobe projects caudad; it is somewhat conical, but is distally (caudally) rounded and is a little flattened dorsoventrally. On each side of the median lobe the large and conspicuous branchiform organ projects ectocaudad. Each presents two principal divisions, a minor ectocephalic one, composed usually of three equal lobes or filaments, and a major division which is pinnately branched, the branches along each side of the principal stem sometimes showing slight secondary ones. (Plate **66**, fig. 2, 3).

The somites in general are long, in the middle region of the body being fully half as long as wide, the length greater in proportion to the width in the narrow region. The somites, toward the sides especially, show usually four secondary rings separated by sulci; these sulci are commonly less deep dorsally and ventrally. The parapodia arising on the most caudal ring of each somite. The pygidium is short and is shaped somewhat like the frustrum of a cone, with the caudal surface broad. Anal cirri lost. (Plate **66**, fig. 4).

While the styles of all cirri are lost, the cirrophores are prominent and show the same arrangement as in the preceding species. A style found loose in a vial with one specimen is broad, with the edge evenly rounded. There is a single cirrus on each side of each of the first two postcephalic somites. On the others, both notocirri and neurocirri are present above and below the setigerous tubercle. The cirri on each somite on each side are widely separated, arising from opposite ends of a common elevation, on the middle of which the setigerous lobe arises as a low conical eminence. The setae in each parapodium are two in number, one on each side of the aciculum, as usual. They are colorless, evenly moderately curved, and prominent.

Localities. Off Peru: Sta. 4661 (lat. 10° 17′ S., long. 88° 02′ W.). Surface. Surface temp. 69° F. 15 November, 1904. One specimen.

Off Peru: Sta. 4671 (lat. 12° 07′ S., long. 78° 28′ W.). Surface temp. 66° F. 20 November, 1904. One specimen taken at surface.

Off Peru: Sta. 4675 (lat. 12° 54′ S., long. 78° 33′ W.). 300 fms. to surface. Surface temp. 68° F. One rubbed specimen, probably this species.

Southwest of the Galapagos: Sta. 4717 (lat. 5° 11′ S., long. 98° 56′ W.).

300 fms. to surface. Surface temp. 75° F. 13 January, 1905. One specimen.

This is a conspicuously larger species than *P. simplex* and, unlike the latter, shows a distinct annulation of the somites from encircling sulci. It is at once to be separated from the other species in having the large, conspicuously branched, branchiform nuchal organs instead of wholly simple ones.

TOMOPTERIDAE.

These are highly peculiar, exclusively pelagic annelids of small size, in which the body is colorless and transparent. The number of somites is small, and between them there are no distinct intersegmental furrows or constrictions.

The prostomium is fused with the first somite to form a single part which bears in front a pair of short tentacles and laterally behind these two pairs of tentacular cirri, or in some the first pair may be lacking. The second pair of cirri is very long, being from two thirds the total length of the body to longer than it, the first pair on the contrary being mostly small and inconspicuous. Each of the second cirri contains a central seta which extends throughout its length, and a similar seta may occur in the anterior ones. Eyes two. Mouth ventral in position.

The parapodia are conspicuously extended laterad and each is distally bifurcate, each short ramus bearing a characteristic, flattened, thin cirrus which contains mucus glands suggesting those of the Phyllodocidae. Aside from these glands certain peculiar "rosette formed organs" may occur in the parapodia and sometimes in the bases of the cirri. These are very useful in classification. Neither acicula nor setae are present in any of the parapodia.

In some species the body is more or less extended caudad into a slender caudal division, or tail, on which the parapodia are rudimentary or obsolete.

The blood is colorless. The eggs lie free in the body-cavity.

The alimentary canal is straight; it presents a large principal division, or intestine, and anteriorly a short pharynx with a short proboscis.

Two genera are known, Tomopteris and the more recently described Enopteris of Rosa (Public. inst. stud. superiore, Firenze, 1908, 1). Priarea Quoy and Gaimard is the same as Tomopteris.

TOMOPTERIS Eschscholtz.

Isis, 1825, p. 736.

TOMOPTERIS INNATANS, sp. nov.[1]

Plate **27**, fig. 3.

Body not pigmented, transparent, or nearly so.

The body has a conspicuous caudal appendage, or tail, on which the parapodia are reduced, or rudimentary. In the type there are eighteen distinct pairs of parapodia, of which the last three pairs are on the caudal appendage and are much reduced, with caudad of them vague traces of a few other parapodia.

Head with tentacles not thick, relatively long, flattened, and moderately acuminate. First tentacular cirri not present. The second tentacular cirri longer than the body, but not more than half as long again.

Brain transversely somewhat oblong, with the caudal side a little concave and the anterior convex and mesally transversely truncate. (Plate **27**, fig. 3.). Eyes with pigment black, the number of facets not to be made out with certainty in the types.

The parapodia have the fins rather large, broadly acuminate beyond the distally rounded or somewhat pointed end of the parapodium proper, conspicuously differing from *euchaeta,* in which the fin forms only a narrow fringe along the side and end. Parapodia more in general form like those of *septentrionalis,* with the fin-membrane attached along both sides of the rami and extending much beyond. Glands present in ventral fins, or in all excepting the first three pairs; but the preservation is such that examination for their detailed structure could not be satisfactorily made.

The length, including the tail, is 10+ mm., and exclusive of the tail, about 7 mm. Length of the second cirri 11 mm. In the paratype the cirri are relatively longer, length 9.25 mm., where the body length is only 6.5 mm.

LOCALITIES. California to Marquesas Islands: Sta. 3788 (lat. 4° 35′ N., long. 136° 54′ W.). Surface. 8 September, 1899. Two specimens.

Between Easter Island and the Galapagos: Sta. 4711 (lat. 7° 47′ 30″ S., long. 94° 05′ W.). Surface. 31 December, 1904. One small specimen with thirteen pairs of parapodia in front of the tail seems to be this species. Total length 6 mm., with the second cirri measuring 8.5 mm.

This species is like *T. euchaeta* Chun, in having the second cirri longer than the body, which it also resembles in lacking the first cirri, and in its general structure. But, whereas in *euchaeta* the second cirri are from two to four times as long as the body, in the present species their length is from only a little more than one to one and a half as long as the body. The brain is of a different form, the eye-pigment black instead of reddish brown, and the parapodia of a clearly different form, as pointed out above.

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[1] innatare, to swim upon, or float.

The general appearance of this species also suggests *T. idiura*, sp. nov. From this it differs in having the second cirri longer than the body instead of shorter, the relatively shorter tail, of which the terminal part is naked and the parapodia of its proximal portion fewer in number and of different form. The paucity of material, however, makes it difficult to judge the value of some of the characters and differences.

TOMOPTERIS EURA, sp. nov.[1]

Plate **27**, fig. 1, 2.

Colorless and transparent, as usual.

The body has an unusually long and slender caudal appendage, or tail, upon which there are no traces whatsoever of parapodia, excepting a single aborted pair at the cephalic end, which are unbranched and without fins. In front of the tail the body bears nineteen pairs of fully developed parapodia, but with the last few pairs progressively reduced in size. (Plate **27**, fig. 1).

Head with tentacles moderately long, acuminate, curving caudad at their ends. First cirri present, slender, and much shorter than the tentacles. Second tentacular cirri of the usual form, the part present in the larger specimen two thirds as long as the body, exclusive of the tail.

The brain is transversely elongate and narrow anteroposteriorly, being of about the same thickness as the connectives, bowed caudad so that the anterior face is concave. Eye-pigment black. Number of eye-lenses not accurately determinable in the preserved specimens.

The fin-membranes of the parapodia are broad and almost circular, in some irregularly, weakly, crenately lobed. Glands are present in the neuropodial fins of the first and succeeding parapodia, the glandular area being large and very conspicuous in most as a darker circular and thickened area. No glands were detected in the notopodial fins. A rosette is present in each parapodium of the first pair proximad of its bifurcation. No such rosettes detected in any other parapodia, but rosettes occur in the bases of the fin-membranes in many of the parapodia, though the exact distribution could not be determined satisfactorily. (Plate 27, fig. 1).

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[1] *εὖ*, good, and *οὐρα*, tail.

Length without tail, near 11.75 mm. Length of tail 7 mm., making the total length 18.75 mm.

Locality. Off Peru: Sta. 4659 (lat. 8° 51′ S., long. 86° 05′ W.). Surface to 300 fms. 14 November, 1904. One specimen.

This species is most readily distinguished from others by the presence of a rosette in the trunk of the first parapodia and its absence from all others excepting in the fins, together with the strikingly peculiar long, slender, and naked tail. The form of the brain and the form and structure of the parapodial fins are also of diagnostic value.

Tomopteris idiura, sp. nov.[1]

Plate 27, fig. 4–6.

The body and appendages colorless, or nearly so, and transparent.

There is a long, attenuated caudal division, or tail, upon which the parapodia, while presenting the usual parts and general structure, are very much reduced in size. The attenuation caudad takes place gradually, as does the reduction of the parapodia to the minimum size. What may be regarded as the body proper bears sixteen pairs of parapodia, while the tail, which is apparently broken off at the tip, bears at present six pairs.

Tentacles flattened, distally attenuated, and curved in the usual way. No first tentacular cirri present. Second tentacular cirri of the usual form, not fully as long as the body; in the type as at present, with the tip of the tail broken off, they reach to the next to the last pair of parapodia, the latter being at the broken tip. On each side of the head adjacent to the narrow region bearing the tentacles there is a conspicuously developed ciliated epaulette, which continues as a narrow band on the dorsal surface above the brain. (Plate 27, fig. 4).

The brain transversely oblong in outline, with the anterior face slightly convex. The eye-pigment appears to have been black. The number of lenses not determined.

Fins of parapodia large and distally subcircular in outline and extending along both notopodium and neuropodium to the base. The margin may be indented crenately, with the lobes large and few. No glands were detected in the neuropodial fins of the first and second parapodia; but in the succeeding pairs glands in the neuropodial fins are large, thick, and conspicuous. No rosette in the trunk of the first parapodia. The fins of the caudal parapodia are narrow and form a narrow fringe along the side of the notopodium and neuropodium, and in the last ones is almost absent. The neuropodial and notopodial branches of the tail parapodia are long in proportion to the proximal portion. (Plate **27**, fig. 6).

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[1] ἴδιος, peculiar, and οὐρα, tail.

Ovaries occurring in notopodia only, sometimes extending proximad into trunk of parapodia. (Plate **27**, fig. 5).

Total length about 14.5 mm. Length of body, exclusive of the caudal division, about 9.5 mm., the tail, the tip of which is missing, being thus 5 + mm. long.

LOCALITY. Galapagos near Hood Island: Sta. 4644. Surface. 7 November, 1904. One specimen.

At once distinguished from the preceding in bearing well developed though smaller parapodia along the tail and in lacking rosettes in the trunk of the first parapodia, and especially in lacking the first tentacular cirri.

TOMOPTERIS, sp. a.

Taken with the type of *T. eura*, sp. nov., is an immature Tomopteris 3 mm. long. It has thirteen pairs of parapodia, with the rudiments of a fourteenth pair. There is indication of the beginning of the tail, but the appendage is very short. The second cirri are longer than the body as in *T. innatans*, to which species it may belong. There are no first cirri.

LOCALITY. Off Peru: Sta. 4659 (lat. 8° 51′ S., long. 86° 05′ W.). Surface. 14 November, 1904.

TOMOPTERIS, sp. b.

A small specimen about 3.5 mm. long, in which there is but a short tail. Fourteen pairs of parapodia are developed on the body and one pair at the base of the short tail, which extends but slightly beyond them. The second cirri are much longer than the body. The specimen is not definitely identifiable in the present state of our knowledge.

LOCALITY. Off Lower California: Sta. 4583 (lat. 22° 45′ N., long. 110° 5′ W.). 300 fms. to surface. Surface temp. 83° F. 11 October, 1904.

SYLLIDAE.

The members of this family have usually a definitely segmented thread-like body; commonly, but not always, with tentacles and cirri strongly articulated or moniliform, and often long.

The prostomium bearing a pair of palpi in varying degrees of separation, three tentacles, and usually two pairs of eyes, or more rarely three, and even four pairs, of small size.

Peristomium usually bearing one or two pairs of tentacular cirri, these rarely absent; in some with setae.

Other somites with parapodia in most uniramous, a notopodial branch, however, appearing at sexual maturity in a certain number of genera. Dorsal and ventral cirri usually present, but may be lacking.

Setae both simple and composite, of varying forms, or rarely only simple setae occurring.

Pygidium with a single pair of cirri and sometimes with a short median process.

Proboscis typically showing an anterior chitinous region and a posterior muscular one; bearing at the anterior end a series of soft papillae and either unarmed or, more commonly, bearing one or more teeth.

The syllids in the complexities of their reproduction are remarkable. Schizogamy is frequent and of great variety.[1] In direct reproduction, or epigamy, the syllids present phenomena wholly comparable to those so long known among certain nereids, which at sexual maturity undergo marked transformations, giving in Nereis the Heteronereis phase. As in the nereids the transformation to the epitokous phase is manifested principally in an increased development of the sensory organs and in the development of accessory locomotor apparatus in the posterior region of the body.

The members of this family are, with rare exceptions, of small size and are often more or less transparent. Phosphorescence has long been known in the group.

They live ordinarily in the immediate vicinity of the shore, abounding between tide-marks under stones and shells, and especially among Algae, hydroids, and bryozoans. They occur as commensals in sponges and ascidians, and several forms are parasitic (*Cf.* Eisig, Fauna u. Flora Golfes Neapel, 1896, **28**; Treadwell, Bull. Amer. mus. nat hist., 1909, **26**; Potts, Camb. philos. soc. Proc., 1912, **16**). Ichtyotomus, as a result of its parasitic habits, has been so modified that Eisig makes it the type of the Ichthyotomidae. A few species range to considerable depths, 600 fms., and one form, *Syllis abyssicola* Ehlers, occurs at a depth of 1,380 fms. (*Cf.* Ehlers, Annulata in exped. Porcupine capta Ann. mag. nat. hist., 1874, ser. 4, **13**, p. 295), and *S. alternata* Moore at 1,400 fms. On the other hand, the epitokous stages of such forms as Autolytus are pelagic.

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[1] *Cf.* especially the monograph by Malaquin, Recherches sur les syllidiens, 1893.

Also, St. Joseph, Les annélides polychètes des cotes de Dinard, Ann. sci. nat. Zool., 1887, ser. 7, **1**. Viguier, Etudes sur les animaux inférieur de la Baie d'Alger, Arch. zool. exper., 1884, ser. 2, **2**. Johnson, Biol. bull. 1906, **2**; Amer. nat., 1902, **36**.

The fact that but little shore collecting was done by the Albatross during the expeditions with which this paper deals accounts for the comparative paucity of syllids and for the preponderance of pelagic forms among those secured, five out of the six species being represented by their pelagic or epitokous forms. Similarly, in the large annelid collection secured by the Challenger only eleven species are syllids. Grube records fifteen species from the Philippines. On the contrary, Ehlers (Festschr. K. gesellsch. Göttingen, 1901, p. 84) records twenty-two species from the littoral region of the Magellan Strait. In the collection of about one hundred and eighty-seven annelid species from Southwest Australia, secured in the littoral region, or from but moderate depths, Augener found thirty-eight species of Syllidae (Fauna Südw.-Austr. Polych., 1913, **4**, p. 68, 190 ff.), a number in excess of those of any other family and rivalling the forty species secured by Langerhans in 1879 from the region of Madeira (Zeits. wiss. zool., 1879, **32**, p. 514). The fewness of syllids in many collections from regions where an abundance of species would naturally be expected is undoubtedly in large part due to the fact that these annelids are mostly very small and require greater attentiveness and special methods for their detection and preservation.

Key to the Subfamilies and Genera.

I. Forms not parasitic or not permanently so.

A. Ventral cirri absent; cirri not articulated..*Autolytinae.*
  a. All parapodia having dorsal cirri.
    b. Dorsal cirri filiform or subulate.
      c. Pharynx with a crown of teeth or trepan.
        d. Setae bidentate at tip..*Autolytus* Grube.
        dd. Setae with tip of blade entire; palpi separated distally..................*Sylline* Grube.
      cc. Pharynx unarmed..*Autolytides* Malaquin.
    bb. Dorsal cirri not filiform or cylindrical.
      c. Dorsal cirri foliaceous or partly so.
        d. Tentacles and cirri long, expanded and foliaceous only distally......*Myriana* Savigny.
        dd. Tentacles and cirri very short, leaf-like throughout................*Phyllosyllis* Ehlers.
      cc. Dorsal cirri clavate..*Virchowia* Langerhans.

aa. Dorsal cirri present only on the first setigerous somite................*Procerastea* Langerhans.

AA. Ventral cirri present.

B. Palpi not fused; cirri and tentacles articulated, moniliform..........................*Syllinae.*

a. Parapodia without branchial appendage.

b. Pharynx unarmed.

c. Setae all simple; four (or three) minute eyes in a transverse row on each side. *Synelmis*, gen. nov.

cc. Composite setae present; two eyes on each side, these not in a transverse row.

d. Tentacles and notocirri entire, short and fusiform and covered with papillae. *Rhopalosyllis* Augener.

dd. Tentacles and notocirri moniliform and moderately long, not papillose. *Xenosyllis* Marion et Bobretzky.

bb. Pharynx armed.

c. With a single large tooth.

d. Tooth anterior.

e. Tentacular cirri present; first somite without setae.............*Syllis* Savigny.

ee. Tentacular cirri absent; first somite with setae................*Isosyllis* Ehlers.

dd. Tooth posterior.......................................*Opisthosyllis* Langerhans.

cc. With a large tooth accompanied by a trepan, or with a trepan alone.

d. A large tooth accompanied by a trepan.

e. Cirri consisting of several articles.

f. Setae all simple......................................*Trypanosyllis* Claparède.

ff. Anterior setae compound, others crochet-form, simple...........*Synsyllis* Verrill.

ee. Cirri spherical, undivided.......................................*Eurysyllis* Ehlers.

dd. A trepan alone.

e. Notocirri jointed; neurocirrus stout and blunt, fused proximally with the parapodium; nuchal organs forming large "epaulettes"................*Pterautolytus* Ehlers.

ee. Notocirri not jointed; neurocirrus flattened and pointed, not fused with parapodium; nuchal organs not conspicuously developed................*Parautolytus* Ehlers.

BB. Palpi more or less fused.

C. Fused only at base; cirri and tentacles usually simple and smooth, rarely in some degree articulated ....*Eusyllinae.*

a. Pharynx straight.

b. Pharynx unarmed.

c. With a large flap projecting from peristomium over prostomium; tentacles tapering. *Hesperalia* Chamberlin.

cc. With no such peristominal lobe; tentacles clavate.................*Syllides* Oersted.

bb. Pharynx armed.

c. With a large tooth.

d. The tooth single, unaccompanied.

e. Tooth posterior in position.........................*Opisthodonta* Langerhans.

ee. Tooth anterior...*Pionosyllis* Malmgren.

dd. The large tooth accompanied by an incomplete trepan of small teeth.

e. Setae all simple...*Hemisyllis* Verrill.

ee. Setae in part composite.

f. Tentacles and cirri smooth.............................*Eusyllis* Malmgren.

ff. Tentacles and cirri moniliform; palpi united to middle....*Desmosyllis* Verrill.

cc. With a semicircle of large recurved corneous papillae or teeth....*Odontosyllis* Claparède.

aa. Pharynx sinuous.

b. With no tentacular cirri; notocirri rudimentary....................*Fauvelia* Gravier.

bb. Tentacular cirri present; notocirri not rudimentary.

c. Unarmed.

d. With only composite setae............................*Campesyllis* Chamberlin.

dd. With both simple and composite setae...........*Streptosyllis* Webster & Benedict.

cc. Armed with a large tooth and trepan; with nuchal flaps..........*Amblyosyllis* Grube.

CC. Fused throughout length...*Exogoninae.*

a. With one pair of tentacular cirri.

b. Tentacular cirri rudimentary; appendages (tentacles and cirri) cylindrical; prostomium distinct from the peristomium...................................*Exogone* Oersted.

bb. Tentacular cirri well developed; appendages swollen at base and pointed at tip; prostomium and peristomium coalesced.
  c. Ventral cirri present, short and filiform.................... *Sphaerosyllis* Claparède.
  cc. Ventral cirri absent.................................... *Microsyllis* Claparède.
aa. With two pairs of tentacular cirri.
  b. Setae compound; tentacles and cirri fusiform, elongate........ *Brania* Quatrefages.
  bb. Setae all simple.................................... *Alluandella* Gravier.

II. Permanently Parasitic Forms.

a. With a suctorial mouth and a retractile proboscis armed with two stylets operating like scissors; prostomial appendages rudimentary; coeca of alimentary canal in each somite filling entire body cavity. (Parasitic on the eel, *Myrus vulgaris* L., and probably other fishes). *Ichthyotomus* Eisig (*Ichthyotomidae*).
aa. Proboscis in the adult permanently extruded, non-retractile, with no stylets, strongly chitinous, deeply imbedded in tissue of host; prostomial appendages not rudimentary; alimentary canal without such coeca. (Parasitic on other polychaetes and on nemertines)...*Parasitosyllis* Potts.

Synonymy of Genera.

Of the considerable additional number of generic names that have been proposed in this family, most fall as synonyms in the system here accepted, while others are too imperfectly known at present to be placed with certainty.

Ancistrosyllis, established for *A. groenlandica* McIntosh (Trans. Linn. soc. London, 1877, ser. 2, **1**, p. 502), is a hesionid. Langerhans's species *albini* (Nova acta Acad. Caesareae Leop.-Carol., 1881, **42**, p. 107), referred to this genus, probably belongs in the Exogininae. In the latter the proboscis is wholly unarmed and shows no subdivision into chitinous and muscular regions. A dorsal aciculum is present in this species.

Grube does not describe the proboscis of his genus Platysyllis, which accordingly cannot be placed with certainty. From other characters Malaquin thinks the genus in its relationship is intermediate between Trypanosyllis and Eurysyllis.

Polynice Savigny and Amytis Savigny are doubtful genera, possibly near or the same as Autolytus.

Heterosyllis, established by Claparède for his species *brachiata,* a small form only 2 mm. long and possessing twenty-three somites, is too imperfectly described to be satisfactorily estimated. Other doubtful genera are Laomedora, Lapithas, Periboea, and Thoe.[1] Likewise doubtful is Umbellisyllis Sars.

Cystonereis Kölliker, Exotokas Ehlers, Oophylax Ehlers, Spermosyllis and

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[1] Erected by Kinberg, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 249, 250.

Paedophylax Claparède, Schmardia, Syllia and Gossia Quatrefages, are regarded as synonymous with Exogone Oersted.

Eurymedusa Kinberg is the same as Trypanosyllis Claparède.

Brania Quatrefages has as synonyms Grubea Quatrefages, Salvatoria McIntosh, and Grubeosyllis Verrill, the latter unnecessarily proposed to replace Grubea, which is preoccupied.

Anaplosyllis Claparède is in synonymy with Syllides Oersted.

Claparedia Quatrefages is referable, with some doubt, to Eusyllis Malmgren.

Pterosyllis Claparède, Nicotia Costa, Gattiola Johnston, Thylaciphorus Quatrefages, are in synonymy with Amblyosyllis Grube.

Tetraglene Grube (= epitokous form) and Pseudosyllis Grube are congeneric with Trypanosyllis Claparède.

Polymastus Claparède falls to Eurysyllis Ehlers.

Myrianida Milne Edwards (1845) is regarded as synonymous with Myriana Savigny (1820) since the types *M. fasciata* Milne Edwards and *M. longissima* Savigny, are one and the same species and identical with *Nereis pinnigera* Montagu (1808). Nereimyra Blainville is also a synonym of Myriana.

AUTOLYTUS Grube.

Archiv. naturg., 1850, **16**, p. 310; A. AGASSIZ, Boston journ. nat. hist., 1862, **7**, p. 392; EHLERS, Borstenwürmer, 1864, p. 263; ST. JOSEPH, Ann. sci. nat., 1886, ser. 7, **1**, p. 214; MALAQUIN, Recherches sur les syllidiens, 1893, p. 75; MCINTOSH, British annelids, 1908, **2**, pt. 1, p. 209.

Nereisyllis BLAINVILLE, Dict. sci. nat., 1828, **57**, p. 472.

Proceraca EHLERS, *Op. cit.*, 1864, p. 221, 256.

Stephanosyllis CLAPARÈDE, Mem. Soc. phys. hist. nat. Genève, 1864, **17**, p. 107.

Autolytus + *Proceraea* CLAPARÈDE, *Op. cit.*, 1868, **19**, p. 525, 529; LANGERHANS, Zeitschr. wiss. zool., 1879, **32**, p. 577.

Males.

Polybostrichus OERSTED, Grönlands Annulata dorsibranchiata, 1843, p. 31.

Diplocerea GRUBE, Archiv. naturg., 1850, **16**, p. 312.

Crithida GOSSE, Ann. mag. nat. hist., 1855, ser. 2, **16**, p. 308.

Sacconereis M. Müller, Archiv. anat., 1855, p. 15.

Females.

Sacconereis J. MÜLLER, Abh. Akad. wiss. Berlin, 1853, 1852, p. 7; M. MÜLLER, Archiv. anat., 1855, p. 15.

AUTOLYTUS OBLIQUATUS, sp. nov.[1]

Plate **19**, fig. 8; Plate **20**, fig. 1–3.

Epitokous Male (*Polybostrichus*).

The body in general is colorless and translucent, in life probably transparent, the only dark parts being the eyes and the first six setigerous somites, which are darkened from the masses of spermatozoa confined to them.

The average length is near 6.5 mm. Exclusive of the parapodia, the body is widest in the anterior or seminiferous region, the body immediately behind this being abruptly narrower, typically thereafter again gradually widening over eight or ten somites and then very gradually and continuously narrowing to the caudal end, where it is slender and pointed. The number of somites in the anterior division, that is, the division in front of the first somite bearing long natatory setae in addition to the short ones, is constantly eight, six of which are setigerous; and in the posterior division typically thirty-three, making the total number forty-one.

The prostomium is broad, laterally convex, with the anterior margin incurved between the bases of the palpi. The palpi, fused with the bases of the tentacles excepting distally, are proximally thick, swollen, bulging, and in contact with each other mesally, or nearly so, and narrowing distad. A little above the base each is always bent abruptly ectad. Palpus and antenna on each side separating near middle of total length, with each branch cylindrical, gently narrowed distad, narrowly rounded at tip, and with numerous short annuli which are not very strongly marked. The minor paired tentacles are situated dorsally between the eyes, each in line with the corresponding palpus and at an anteroposterior level midway between the two pairs of eyes; each is short, cylindrical or somewhat compressed, and distally rounded. The median tentacle is attached caudad of the eyes between the tentacular cirri. It is stout at base, tapering distad to a fine tip; it is long, reaching to the seventeenth or eighteenth somite (fifteenth or sixteenth setigerous). As usual, two pairs of eyes. The posterior eyes dorsal in position, strongly, subconically elevated, with the lenses directed dorsad, small. The anterior eyes are much larger; they are a little farther forward and are on the ventral side of the head, strongly elevated, and with the lenses directed almost strictly ventrad. (Plate **20**, fig. 1, 2).

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[1] obliquare, to bend to the side.

The first somite, or the region morphologically representing it, bears two pairs of tentacular cirri, of which the dorsal on each side much exceeds the ventral in length and thickness; though itself not long, reaching only to the third or beginning of the fourth setigerous somite, the ventral one scarcely reaching to the second. The annuli are vague. (Plate **20**, fig. 1, 2).

The second somite bears on each side a small neuropodial tubercle which shows no setae. Above this is a very large tentacular cirrus of very nearly the same form and size as the median tentacle, thus greatly exceeding the other tentacular cirri.

The third and succeeding somites are setigerous. The first six setigerous somites are sharply set off from the rest of the body as a distinct region. These somites are all dark in color, from the contained masses of spermatozoa which crowd the parapodia, including the proximal region of the notocirri, as well as the somites proper. They are further distinguished by their short, subconical parapodia directed laterad and bearing only the short, stout composite setae. The first pair of these parapodia are more slender than the others. The notocirri are short, a little surpassing the setae, and are swollen proximally as shown in the figures. (Plate **19**, fig. 8; Plate **20**, fig. 1, 2).

The second and much larger division of the body is sharply differentiated by its transparency. The parapodia are much longer and are directed usually, at least in preserved specimens, caudoectad, though often in part cephaloectad. They are deep dorsoventrally, but thin and compressed anteroposteriorly, with the anterior face convex, or flat, and the caudal flat, or more or less concave. Distally each parapodium is bilobed, with the depression between the two lobes weak, the dorsal lobe the larger. On each lobe there is a low but relatively wide, thin, transparent, postsetal lip. The dorsal lobe bears long simple setae, the ventral one only short, stout, composite ones like those of the anterior division. The notocirri are transparent, all short, cylindric, and attached far distad. No anal cirri were detected in any of the specimens. (Plate **20**, fig. 1).

The composite setae in the anterior parapodia appear to average near twelve in number. Each has the shaft gently curved, especially distad of the middle, and abruptly stronglv enlarged at the distal end, where it forms the socket; the distal edge is oblique, with few fine pointed teeth on each side and at the apex with a much larger one. The distal piece is of the usual general form. At the tip it is bidentate, the teeth moderately oblique, short, and not very acute, subequal, but the lower more commonly somewhat the larger. The simple capillary natatory bristles as usual are numerous, long, and very fine at the tips.

Locality. Gilbert Islands: off Apaiang. Surface. Surface temp. 84° F. 3 January, 1900. Numerous specimens taken at night by electric light.

This species in lacking any distinct markings as well as in limited number of somites of the anterior division of the body presents resemblances to *A. prolifer* O. F. Müller, though numerous differences appear upon closer study. The palpi present uniformly a strongly marked difference in being conspicuously geniculate near the base, the organs distad of the angle extending directly ectad and presenting a very characteristic appearance. The tentacular cirri are less smooth, showing distinct evidence of numerous annuli. The minor tentacles are attached nearer the middle line. The median tentacles and the tentacular cirri are much longer. The number of somites bearing only composite setae is constantly six. The main division of the body wholly lacks pigment, instead of being yellowish.

AUTOLYTUS PLANIPALPUS, sp. nov.[1]

Plate **20**, fig. 4; Plate **21**, fig. 1, 2.

Epitokous Male (*Polybostrichus*).

The general color is yellow, excepting the blackish eyes and the anterior seminiferous division, which is brown. The cirri, tentacles, and palpi are nearly colorless, somewhat whitish.

The body of the type consists of an anterior region of fourteen setigerous somites, in which the setae are all of the coarse composite type and all of which are crowded with masses of spermatozoa, and of a longer posterior region which contains no sexual products and which has long, simple, natatory setae in addition to the coarse composite ones. The posterior region is regenerated posteriorly, the more slender regenerated portion embracing twenty-four somites and the anterior portion thirty-six less crowded somites, making a total of sixty for the region. The total number of somites in the body is seventy-five, of which seventy-four are setigerous. The total length is near 9.5 mm.

The prostomium is transversely oblong, the anterior margin long and straight. The palpi, or the fused palpi and paired tentacles, are strongly flattened, thin, and very broad proximally. They extend along the upper surface of the prostomium obliquely a little ectad of caudad to or beyond the posterior eyes which are thereby nearly wholly covered. They are narrowed abruptly near the middle of their length at the level of the bifurcation, the two branches beyond this being cylindrical, and the ventral one larger than the dorsal (mesal). The annuli are short, numerous and distinct. The minor, or posterior paired, tentacles are farther caudad than usual, being attached between the posterior eyes and partly covered by the edges of the palpi. They are short, conical and distally rounded. The median tentacle is, as usual, attached far caudad between the tentacular cirri. It is stout at the base, continuously tapering distad, and it reaches to about the twenty fourth setigerous somite. The annulations are strongly marked. The eyes on each side are situated on the side of the head, the posterior one distinctly caudad of the other and much smaller in size. The lenses of the anterior eyes are directed nearly cephalad. (Plate **21**, fig. 1).

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[1] planus, flat, and palpus.

The first somite has lost the tentacular cirri, scars, however, showing their places of origin.

The second somite is setigerous, the neuropodia being well developed and like those of the immediately succeeding somites. It bears a pair of large tentacular cirri closely similar to the median tentacle in form and size. The ceratophore is short and the annulations are strongly marked. (Plate **21**, fig. 1).

The third and succeeding twelve somites are sharply set off from those farther caudad. They are short and closely crowded, are dark from the contained masses of spermatozoa and have short, conical, distally rounded parapodia bearing only the shorter composite setae. The neurocirri are attached at the bases of the parapodia above. They are gently tapered distad, rounded at the tips, distinctly annulate, and much exceed the setae.

The parapodia of the second division of the body are longer; they are very deep dorsoventrally but are conspicuously flattened, relatively thin, in the cephalocaudal direction. Each parapodium is distally divided into two lobes, of which the ventral one shows also a small secondary notch. Each parapodium bears a notocirrus which is attached above near the distal end; it is tapered conspicuously, is strongly annulate and is shorter than those of the anterior somites. (Plate **20**, fig. 4). Anal cirri missing from type.

The composite setae of the typical parapodia are usually eight to ten in number, these decreasing in length from above ventrad. The shaft is of the usual slightly curved form, abruptly enlarged at the distal end and with the distal edge of the socket moderately oblique, the teeth fine and acute, with the most distal one not especially large. The terminal piece is distally narrow, the terminal part small and scarcely bidentate, the teeth small, very obtuse and often obscure. The edge below the lower tooth extends out into an obtuse angle, above which it is finely, shortly setose. (Plate **21**, fig. 2). The simple setae are very fine and numerous, twenty or more in each group.

Locality. Gilbert Islands, off Apaiang. Surface. Surface temp. 84° F. 3 January, 1900. One specimen taken at night by electric light.

A strongly marked species characterized by the conspicuously enlarged and flattened palpi at base extending back between eyes, in the presence of setae on the second somite, and in the comparatively large number of somites in the anterior division of the body.

Autolytus torquens, sp. nov.[1]

Plate **19**, fig. 5–7.

Pelagic Female (*Sacconereis*).

The general color is an opaque yellow, this being due to the dense mass of eggs filling the body, the integument itself being transparent or translucent; the tentacles and cirri are colorless, or nearly so, and translucent.

The body in the type is nearly 15 mm. long, the precise length not being ascertainable because of the strongly coiled state. The body is slender, widest near beginning of the second third of length from where it narrows cephalad and very gradually caudad, the posterior region becoming very slender. The total number of somites is nearly one hundred. Of the setigerous somites the first six belong to the anterior division of the body, in which only the short composite setae are present.

The prostomium is transversely oblong, with the anterior margin widely angularly indented or evenly incurved at the middle between the paired tentacles. Each paired tentacle situated on the anterior margin toward the ectal end in front of the eye; short, tapered, very distinctly annulated. The median tentacle is attached on the dorsal surface between the eyes and is somewhat larger than the paired tentacles. The anterior eyes are much larger than the posterior; each is situated on the anteroectal portion of the prostomium which bulges out conspicuously, and its lens is directed nearly ectad. The posterior eyes are much smaller; each is situated obliquely mesocaudad of the corresponding anterior eye.

The first somite is considerably raised above the level of the prostomium.

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[1] torquere, to twist or curl.

It bears two pairs of tentacular cirri which are shorter and more slender than the tentacles; they are composed of distinct short articles and may appear somewhat moniliform; the dorsal cirri reach to the fifth somite, the much shorter ventral ones to the third.

The second somite is setigerous, the process being like that of succeeding somites. It is dorsally more elevated than the first. It bears a pair of dorsal cirri of nearly the same form as those of the immediately succeeding somites and but little longer. Dorsally it presents an elevated area that protrudes forward as a characteristic triangular tongue, which is truncate anteriorly. The third and fourth following somites are similar to the second, but are more highly arched, the depth of the anterior division of the body being greatest through the last two of these. The somites are weakly convex ventrally. All somites distinct and entire. In the second division of the body the somites continue to increase in depth over about twelve somites and then decrease gradually caudad. The anal cirri are short, very narrowly elliptic in outline. All somites of the body are crowded with eggs, which occur also in the bases of the parapodia.

The anterior parapodia are short and cylindric, distally shortly, subconically rounded. The notocirrus is attached well above the base on the side of the somite. The cirrophore is short and much broader than the style, which is exceptionally long, extending far beyond the tips of the setae and being nearly three times the length of the parapodium; the style is slightly tapered and its annuli are usually moderately distinct. The setae are usually twelve in number. The parapodia of the posterior division of the body are short, and very deep as compared with the thickness in the anteroposterior direction. Each presents two very distinct divisions, a shorter, stouter dorsal one bearing the numerous, fine, simple setae and a much more slender and longer, subcylindrical ventral one diverging ectoventrad from the other and bearing the composite setae. The notocirrus is attached near the distal end of the upper division. The cirrophore is short and not thickened. The style is more than half the length of the simple setae. (Plate 19, fig. 5, 6).

The composite setae of a typical parapodium of the middle region of the body are twelve in number, or near that, those of a series decreasing in length from above ventrad as usual. In each the shaft is moderately curved, with the concavity ventrad, and abruptly enlarged at the distal end to form the socket. The distal edge of the socket on each side is moderately oblique and finely dentate. The distal piece is of the usual general form. It is distally bidentate, with the teeth moderately large and scarcely differing in size, or, if any different, the more ventral one the larger. (Plate **19**, fig. 7). Into the dorsal branch extends a fascicle of acicular fibrillae, none of which protrudes from the surface. The capillary setae are numerous, long and slender, and distally narrowing to a very fine, acute and curved tip.

LOCALITY. Gilbert Islands: off Apaiang. Surface by electric light. Surface temp. 84° F. 3 January, 1900. Three specimens taken.

It is barely possible that this may be the female of *A. obliquatus* described above, but whether this is so can be satisfactorily determined probably only from material that will make possible a tracing of the sexual buds from the stalk. The two forms resemble each other in the general structure of the setae, though differing in finer details, and in having alike six somites in the anterior region bearing only composite setae; but they differ widely in all other respects. A very characteristic feature of this form is presented by the typical parapodia in having two divisions strongly marked and well separated and divergent.

SYLLIS Savigny.

Descript. Egypte. Hist. nat., 1809 (= 1822), **1**, pt. 3, p. 43; GRUBE, Archiv. naturg., 1850, **16**, p. 309; EHLERS, Borstenwürmer, 1864, p. 220, 222; LANGERHANS, Zeitschr. wiss. zool., 1879, **32**, p. 526; MALAQUIN, Recherches sur les syllidiens, 1893, p. 71; MCINTOSH, British annelids, 1908, **2**, pt. 1, p. 188.

Lycastis SAVIGNY, *Op. cit.* 1809 [= 1822], **1**, pt. 3, p. 45.
Ioda JOHNSTON, Ann. mag. nat. hist., 1840, ser. 1, **4**, p. 231.
Lalage F. MÜLLER, Archiv. naturg., 1858, **24**, p. 211.
Gnathosyllis SCHMARDA, Neue wirbellose thiere, 1861, **2**, p. 69.
Trichosyllis SCHMARDA, *Ibid.*, p. 73.
Pagenstecheria QUATREFAGES, Hist. nat. annelés, 1865, **2**, p. 40.
Aporosyllis QUATREFAGES, *Op. cit.*, 1865, **2**, p. 87.
Chaetosyllis MALMGREN, Annulata Polychaeta, 1867, p. 44.

This genus was divided by Langerhans (*Op. cit.*, 1879, **32**, p. 527 ff.) into four subgenera on the basis of the character of the setae.

Key to Subgenera.

a. Setae all simple .... *Haplosyllis* Langerhans.
aa. Setae in part or exclusively composite.
  b. Setae all composite, varying but little in size .... *Typosyllis* Langerhans.
  bb. Simple setae also present or else composite setae of very different form or size.
    c. In addition to the composite setae in all somites there are very different simple or composite setae .... *Ehlersia* Langerhans.[1]
    cc. Setae of the posterior somites composite, those of the middle or of the middle and anterior somites simple .... *Syllis* Savigny *sens. str.*

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[1] The subgenus Langerhansia later added by Czerniawsky (Bull. Soc. imper. nat. Moscow, 1881, **46**, no. 2) is regarded as synonymous with Ehlersia.

SYLLIS REMEX, sp. nov.[1]

Plate **21**, fig. 5; Plate **22**, fig. 4–6.

Epitokous Stage.

The general color is deep brown, with the midventral line paler. The neurocirri are colorless. The setae are colorless and transparent.

A broad, strongly flattened form from which the prostomial appendages and the notocirri have been lost. The body is widest near the beginning of the second third of the length and is strongly narrowed cephalad, the anterior end being very narrow and more gradually caudad, with the caudal end also pointed. The greatest width, exclusive of the parapodia, is 1.5 mm.; inclusive of the parapodia 3 mm., and to the tips of the longer setae about 5 mm. The length is 30 mm. Total number of somites ninety-four.

Eyes on each side partly fused, the one directed ventrad, the other dorsad; eyes large. Prostomium deeply incised caudad along the median line between the eyes.

Tentacular cirri two pairs, very short.

The parapodia in the middle region of the body are long, flattened in the anteroposterior direction and deep dorsoventrally at base, narrowing toward the tip. Each presents distally a rounded prominence dorsally and a slender, subconical, ventral one protruding distinctly beyond the other. The ventral lobe bears on its ventral side and near the tip a short, jointed neurocirrus. The notocirrophore is near the middle of the length of the dorsal surface and well toward the caudal edge. (Plate **21**, fig. 5). In the anterior region the parapodia become progressively shorter and thinner, with the dorsal distal lobe reduced and not evident as such on the first three. At the same time on the most anterior parapodia the notocirrophore is shifted farther proximad, on the first one lying at the base. The notocirrophores of the first pair of parapodia are much larger than the others probably in correspondence with much more elongate styles.

In a typical parapodium from the middle region of the body the setae arising from the dorsal tubercle are numerous, long and crowded. They appear characteristically much flattened and thin in one direction, and expanded in the other so as to be easily bent and broken. The tip of each is narrowly rounded, not acute. The short, composite, ventral setae are few in number. In these the shaft is but slightly curved and is gradually enlarged at the distal end. The distal edge is oblique and smooth, weakly sinuous. It is finely fibrillate. The shaft is finely serrate at the distal end along one side. The distal piece is attached at an acute angle at one side, with the proximal edge oblique in correspondence to that of the socket. Long, distally narrowed, and bearing two small, acute and nearly equal teeth, of which the proximal is straight and the distal slightly curved. Proximally, on the same side as the teeth, the edge is closely finely setose. (Plate 22, fig. 4, 5).

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[1] remex, an oarsman.

On the ventral side there are three stout acicula which are much stouter than the setae. Each is narrowed to an acute point distally, but the tip is not fine. The tips lie close together and project but very slightly from the surface. A single aciculum extends into the dorsal lobe; in the distal part of its length it is more slender than the ventral ones and toward the tip curves typically upward. (Plate 22, fig. 6).

Locality. Gilbert Island: off Apaiang. Surface at night, electric light. Surface temp. 84° F. 3 January, 1900. One specimen.

Aside from its exceptional breadth, this species seems to be distinguished particularly by the very characteristic form of the parapodia and by the broad, thin, natatory dorsal setae which are unlike any I have found described for other species. The generic position of the form is very doubtful since the character of any armature in the pharynx, if present, was not successfully elucidated in the single type-specimen and because comparatively so few of the pelagic or sexual forms in the family have been described. The presence of tentacular cirri makes the position of the species in Syllis more doubtful, as the known sexual forms in that genus generally lack these processes.

Synelmis, gen. nov.

Prostomium and peristomium distinctly separated.

Palpi well developed, free, not at all coalesced. Eyes minute, normally four pairs, those on each side in a transverse row. Tentacles very short, subconical, smooth, and unjointed.

One pair of tentacular cirri.

Proboscis unarmed.

Body long and slender. Anal cirri two, short, with no distinct median process between them.

Parapodia biramous, with notopodial as well as neuropodial aciculum strongly developed, and the notopodium proper but weakly elevated. Neurocirri as well as notocirri well developed throughout; swollen proximally and abruptly narrowed distad, smooth and undivided.

A single seta in each notopodium, this simple and very stout. Neuropodial setae numerous and all simple.

GENOTYPE.— *S. simplex*, sp. nov.

This genus stands apart in the character of its eyes, in the absence of composite setae throughout, and in the distinct notopodial development with an aciculum, as indicated for the peculiar genus Ancistrosyllis of McIntosh. In the subgenus Haplosyllis of Syllis the setae are similarly all simple though of a type quite different from those characterizing Synelmis. In the shortness and simplicity of the tentacles it is like Rhopalosyllis described by Augener from Australia (Fauna Südw.-Austr., Polych., **1**, 1913, **4**, p. 245), though these in the latter appear very different from the presence of the numerous papillae. The form of the cirri suggests that characterizing the species of Sphaerosyllis. The general relations of the genus are sufficiently shown in the key (p. 164).

SYNELMIS SIMPLEX, sp. nov.

Plate **28**, fig. 1–5.

Body in general yellow, in parts brownish or somewhat reddish brown. Setae and acicula all colorless.

Body elongate and slender, almost thread-like. Essentially uniform in width excepting at the caudal end, where it narrows to a point, and at the extreme anterior end, where it widens somewhat clavately. The number of somites in a type-specimen is one hundred and sixty-three. The length is 56 mm. and the greatest width, exclusive of the parapodia, 1.2 mm.

The prostomium projects from the dorsal side of the anterior surface of the broad, anteriorly truncate peristomium as a short piece widely convex in front or nearly rounded, triangular and rapidly shorter laterad. It bears two stout, two-jointed palps, which are but slightly separated at base and project almost directly forwards. The terminal article in each palpus is much shorter and narrower than the other, and is rounded. There are three tentacles, all shorter than the palps and slenderly conical, constricted at level of attachment, and colorless and translucent. The median tentacle is attached on the median line toward the caudal edge of the prostomium, projects dorsocephalad and scarcely attains the anterior edge between the palps; each lateral tentacle is attached at the anterior edge of the prostomium toward the outer border of the palpus, along which it projects forwards and fails a little of attaining its anterior end. There are four pairs of very small eyes, the four on each side forming a transverse row caudad of each lateral tentacle; or, in one specimen, two are fused, giving but three pairs of eyes. (Plate 28, fig. 1).

The peristomium is a complete and exceptionally uniform ring longer than the prostomium, and also a little longer than somite II. It is smooth and undivided. Ventrally it presents a transparent, semicircular lower lip projecting a little cephalad of ventrad and having a smooth free edge. The mouth is on the directly anterior surface beneath the prostomium, and is large; in it is seen the proboscis, unprotruded in all the types, this showing radial folds. On each side from the anterior edge, just above the lateral border of the lower lip, where it incurves a little, arise two tentacular cirri; each is constricted at base, above which it thickens considerably and then narrows to an acute point; short, about equalling the somite in length, but much stouter than the tentacles. No setae borne on the peristomium. (Plate 28, fig. 1).

The metastomial somites are entire and smooth. Clearly separated from each other in the middle and posterior region, but without intersegmental furrows in the anterior region. The intersegmental furrows more marked ventrally in other parts than dorsally. Somites cylindrical, being strongly arched above and below, but ventrally showing a median longitudinal ventral furrow which has probably become deeper in preservation.

The segmental organs show as reddish organs through the integument of rounded elevations on the caudal side and against the base of the parapodia, the elevations low. These are distinct excepting on the fifteen to twenty most anterior somites. A pore is visible on the surface of at least some of the elevations. A reddish spot on a slight elevation may also show in front of the parapodia. The pygidium is short, trapeziform, and bears two anal cirri; these are short, only slightly longer than the parapodial cirri, and consist of a short, proportionately thick, proximad article and a slenderly conical style. (Plate 28, fig. 2).

The parapodia are fully developed on all somites from the second, inclusive, caudad and appear to be in essentials uniform. All are biramous, though the notopodium is represented only by a low, broad elevation, into the apex of which extends a well-developed aciculum and through which projects the stout seta, and by the notocirrus which arises on the notopodial elevation ventrocaudad of the seta. The low elevation continues beneath the neurocirrus which projects laterad as a short subcylindrical, distally slightly rounded, or subtruncate, setigerous process, from the base of which on the ventral side arises the neurocirrus. The neuropodia becomes gradually reduced and scarcely evident as distinct processes on the dorsal side of these neurocirri in the caudal region. The notocirrus normally arises from a much constricted narrow base, above which it thickens more or less conspicuously and then tapers subconically and commonly rather abruptly at the tip; there is usually a distinct, short, slender tip abruptly set off against the much thicker proximal region. The neurocirri are of very nearly the same form and size as the notocirri, rising from a slender base on a slight basal article and then expanding into a body shaped like a lance-head, or, more commonly, with the body much thicker, egg-shaped, or, more strictly, elliptic in outline, with the slender, transparent tip abruptly set off. Below the slender tips, the surface of the cirri is characteristically marked off in hexagonal areas. (Plate **28**, fig. 3).

The notopodial aciculum is straight and tapers uniformly to an acute tip which does not emerge through the surface; it is colorless. The neuropodial aciculum is similar but a little smaller, and extends into the neuropodium to the distal end. In each notopodium there is but a single seta, which is simple; this is very stout, much exceeding the aciculum in thickness, being two or three times as thick at corresponding levels; it is very stout at base, narrowing rapidly to the apical portion, which projects a short distance only above the surface near the base of the notocirrus; at the apex it is narrowly acutely rounded; it is very densely, finely fibrillate in the longitudinal direction. (Plate **28**, fig. 4). The neuropodium bears a fascia of numerous simple setae, the longest of which extend only to or scarcely beyond the tip of the neurocirrus. The setae are very fine. Each has a slender base above which it widens, and is somewhat flattened in one diameter, and then again narrows to an extremely fine, smooth, and usually curved tip; in a line along one side of the broader portion there is a close series of slender teeth, or pectinae, which extends from the slender base to the beginning of the fine tip. (Plate **28**, fig. 5).

The proboscis dissected out in one specimen is short and seems to be wholly unarmed and smooth, excepting for a series of papilliform folds about the opening.

LOCALITY. Paumotu Islands: Rangiroa Island, Mohican Reef. 23 September, 1899. Three specimens.

ODONTOSYLLIS Claparède.

Beobacht. anat. entw. wirbell. thiere, 1863, p. 47; MALAQUIN, Recherches sur les syllidiens, 1893, p. 68.
?*Photocharis* EHRENBERG, Abhand. K. akad. wiss. Berlin, 1834, p. 8.

ODONTOSYLLIS ATYPICA, sp. nov.

Plate **21**, fig. 3, 4; Plate **22**, fig. 1–3.

Epitokous Male.

The body is colorless and translucent excepting the eyes and the anterior region, consisting of the somites not bearing natatory setae, which is dark and opaque from the contained sexual products. All setae colorless and transparent.

The type, which is incomplete caudally, is about 18 mm. long. Its greatest width, exclusive of the parapodia, is 1.1 mm.; inclusive of the parapodia 1.5 mm.; and to tips of natatory setae, 2.5 mm. In the anterior division there are thirty-six somites, in the median forty-nine, and in the caudal (incomplete) twenty-six, making a total of one hundred and eleven. The body is widest near the junction of the anterior and median divisions, from where it narrows continuously caudad to the narrow caudal division and also cephalad to the prostomium. The venter is throughout but weakly arched. The dorsum in the anterior region is strongly convexly arched, but toward the caudal region becomes lower and but weakly arched like the venter.

The prostomium is small, bent downward, much wider than long, with the anterior margin incurved between the eyes where the tentacles are attached. There are the usual two pairs of eyes occupying the sides of the prostomium. On each side the upper and more posterior one is elongate in the anteroposterior direction, broadly subfusiform in outline, and with the axis directed dorsoectad. The anterior eye lies below the anterior end of the other one and extends a little farther forward; it is decidedly smaller than the posterior one and is subsemicircular in outline, the convex side ventrad, axis directed nearly straight ectad. The three tentacles arise close together in the anterior furrow of the prostomium, the paired ones lower down than the median. The median is more than twice the length of the prostomium and considerably longer than the paired ones, which are just about twice the length of prostomium. They are strongly jointed, submoniliform. The palpi are broad, distally rounded, flattened processes united at the extreme base and extending directly ventrad. (Plate **22**, fig. 1, 2).

The proboscis presents the usual thickening, with the series of recurved teeth.

The peristomium is reduced and concealed above, but is distinct laterally and below. It is achaetous and bears two pairs of tentacular cirri. Of these the ventral are clearly the shorter; the dorsal ones are subequal to or but little longer than the tentacles. They are strongly jointed. The nuchal organ is in the form of the characteristic flap, appearing distinctly to arise from the dorsum of somite II and extending forwards over the median part of the prostomium to a point caudad of the level of the middle of the posterior eyes. It is broadly subtriangular and distally widely rounded and with the lateral edges curving evenly out ectad at the base. The second and succeeding somites are setigerous. All are simple and very short, smooth. Pygidium not observed.

The parapodia of the anterior region are uniramous. They are short and conical with the distal end obliquely truncate, the ventral edge being shorter than the dorsal, the composite setae, which are alone present, arising from a furrow along the truncate surface. The neurocirrus in each arises on the ventral surface near the proximal end of the oblique surface; it is a stout, short, conical, and translucent process not exceeding the end of the neuropodium, and without annulations. The notocirri arise on the dorsal surface at the very base from stout and rounded eminences in diameter greatly exceeding the style, which is slender; the style extends well beyond the setae; it is strongly jointed. The cirrus of the second somite is much longer than the other cirri and than the tentacular cirri, extending back to about the fourteenth somite. The notocirrus of the third somite is short, of nearly normal length, while that of the fourth and even more so that of the fifth is much more elongate, that of the parapodia of the sixth somite shorter and of the length typical for remaining region of the body. The parapodia of the middle region are biramous, a short conical notopodium appearing above at the base of the foot and bearing a fascicle of long simple setae. The composite setae and the cirri have the same general character as those of the anterior region. In the posterior region the parapodia are again uniramous, the notopodium being absent. (Plate 21, fig. 4).

Acicula of the neuropodia typically two in number, stout, lying in close contact with each other. The notopodial aciculum single, more slender than the neuropodials, distally gently curved. The neuropodial, or composite, setae are all subacicular in position and are arranged in several series. The shaft is distinctly curved; it enlarges clavately distad, more abruptly at the very end about the socket; the distal edge is oblique and appears smooth, but is really obscurely dentate, with the apical tooth largest. The terminal appendage is proportionately very small; proximally it narrows to a slender, acute process by which attached; distally it is bidentate, with the apical tooth much the larger, curved. The notopodial setae are flattened, proportionately to the width very thin, finely fibrillate, distally acutely narrowed and commonly curved.

Epitokous Female.

Fragments of females of this species agree in general structure with the male as above described, excepting that ova are not restricted to the anterior region but occur throughout the length as in the autolytids. The body, in consequence of the contained eggs, is posteriorly more robust. The eyes are clearly smaller than in the male, the upper ones not exceeding the lower and lying more directly above them. (Plate **22**, fig. 3).

LOCALITY. Gilbert Island: off Arhno Reef. Surface by night light. 21 January, 1900. Numerous specimens.

This species is interesting among syllids in having the functional sex-organs distributed as in the pelagic or sexual forms of Autolytus and related schizogamous types, rather than as in the typical epitokous form. This may be one of the species having both types of reproduction, or it may have but the one. The eyes, large as usual in the sexual forms, are distinctive in their form and positions.

SPHAERODORIDAE.

No members of this family were secured by the ALBATROSS on the expeditions with which the present memoir is concerned. The genera may be separated as follows:

Key to Genera.

a. Body long and cylindrical; dorsal surface with two series of spherical capsules; peristomium with a pair of similar appendages.

b. Setae composite...*Ephesiella*, gen. nov.[1]

bb. Setae simple...*Hypephesia* Perrier.

aa. Dorsal surface with six series and ventral surface with four series of spherical capsules without papillae; peristomium with a pair of clavate appendages; body short and broad. *Sphaerodorum* Oersted.

Synonymy of Genera.

Bebryce Johnston is preoccupied.

Pollicita Johnston has as its type *P. peripatus* Johnston (*non* Claparède), which is the same as *flavum* Oersted, the type of Sphaerodorum which has the priority.

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[1] *Ephesia peripatus* Claparède, genotype.

Ephesia Rathke is preoccupied by Ephesia Hübner (Lep., 1816). It was incorrectly restricted by Perrier to species with composite setae, since its type, *E. gracilis*, has simple setae.

HESIONIDAE.

The hesionids are sylloid annelids of but moderate size, in which the number of somites may be as low as twenty-one and only rarely exceeds forty. They are often conspicuously and brilliantly colored and marked, transverse stripes being common.

The prostomium commonly bears a pair of biarticulate palpi. The tentacles may be three, two, or altogether absent. There are two pairs of eyes.

The first one to four somites following the prostomium may be distinct or they may be more or less completely fused. From the first one to all four of these somites may be achaetous and bear each two pairs of tentacular cirri, which accordingly number two pairs, six pairs or eight pairs, while in Taphus none at all are present. Nuchal organs primitive.

On all succeeding somites the parapodia are normal and either uniramous or more or less distinctly biramous, as in the most specialized genera of each of the groups into which the family is separable. Dorsal and ventral cirri are present; they are filiform, frequently very long, and usually more or less distinctly articulated, often moniliform.

The reduced notopodia, when at all present, bear simple setae, the neuropodia composite setae. Rarely (Ancistrosyllis) all the setae are simple. The acicula are in most cases characteristically black in color.

The pygidium bears two anal cirri.

The proboscis is eversible, strongly developed, and may be wholly smooth, may bear simply a crown of papillae, or may be armed with maxillae or stylets or both. Capable of great distention.

A pair of elongate caeca, capable of distention with gas, arising between oesophagus and stomach, or sometimes but one distensible division without caeca.

There is no sharp line of demarcation between the less specialized genera of this family and the Syllidae, as is indicated by such names among hesionids, as now accepted, as Ancistrosyllis and Syllidea. There seems no doubt that under Schmarda's genus Cirrosyllis (Neue wirbellose thiere, 1861, 2, p. 76) are included species belonging in the Hesionidae as well as others in the Syllidae. Various species have been referred to one family by some authors, to the other by others. The more specialized genera are, of course, readily placed.

The hesionids are only rarely taken at more than moderate depths, where they occur commonly on beds of broken shell and coral, in the fissures of rocks, and in tangles of seaweeds, while a fondness for mud has been noted for various species (*e.g.*, *Leocrates atlantica*). Some forms are commensal, such as *Leocratides filamentosus* Ehlers living in a siliceous sponge (*Aphrocallistes bocagei*) (Ehlers, Deutsch. tiefsee exped. Valdivia, **16**, 1908, p. 64), *Dalhousiella carpintieri* McIntosh also living in siliceous sponges (*Cf.* Fauvel, Résult. Camp. sci. Prince Monaco, 1914, **46**, p. 124), and *Oxydromus flexuosus* Delle Chiaji living in the ambulacra of *Astropecten aurantiacus* and other species of the same genus (*Cf.* St. Joseph, Ann. sci. nat., 1888, ser. 7, **5**, p. 327).

Some hesionids, at least, swim readily and actively. The diverticula arising behind the oesophagus, as previously mentioned, are commonly much distended with gas and so may have an hydrostatic function in addition to the respiratory function that compensates for lack of branchiae in these forms (see Eisig, Mitth. Zool. stat. Neapel, 1881, **2**, p. 255). They often do not sink when transferred to fixing or other fluid until bubbles of gas have escaped from the alimentary track. They engulf water as well as air, and are actively carnivorous, preying upon their own kind as well as upon other annelids. Many are highly active and irritable, darting forward or backwards with equal readiness when touched, and if much irritated throwing off appendages or breaking into pieces, such autotomy being a pronounced characteristic in such forms as have been observed in life. The result is that it is difficult to secure specimens entire.

The brilliant colors shown by many species of this family have no obvious connection with their habits. Thus the gaudily colored *Castalia punctata* occurs in deep water and clings persistently to the crevices and under surfaces of rocks, where opportunity for display is meagre. Oftentimes a specially striking color or marking is apparent only at the period when sex-products are carried. Thus the parapodia in the species mentioned become beautifully pink in September from the masses of ova extending into them from their bases. *Castalia fusca*, ordinarily yellowish brown or fawn colored, when carrying ova in May assumes a mauve or purplish pink hue which disappears when the ova are discharged (*Cf.* McIntosh, British annelids, 1908, **2**, pt. 1, p. 124, 129). In some the colors change readily when the sea-water is diluted or otherwise changed; and reversibility is probable. As with the Syllidae numerous genera have been proposed in this family. A critical revision based upon a careful restudy of type-species is much needed.

Key to Genera.

a. With no tentacular cirri.
Proboscis armed with two stylets .... *Taphus* Webster & Benedict.
aa. Tentacular cirri present.
b. Two pairs of tentacular cirri (parapodia uniramous; proboscis with papillae, but no teeth or jaws).
c. Setae all simple; posterior parapodia with a stout, hooked seta, or crochet, projecting above base of notocirrus .... *Ancistrosyllis* McIntosh.
cc. Setae composite; parapodia with no such notopodial crochets .... *Orseis* Ehlers.
bb. With more than two pairs of tentacular cirri.
c. With six pairs of tentacular cirri.
d. Parapodia uniramous.
e. Proboscis unarmed .... *Irma* Grube.
ee. Proboscis with two jaws and a stylet .... *Syllidea* Quatrefages.
dd. Parapodia biramous.
e. Notopodium small or rudimentary.
f. Proboscis smooth, without papillae .... *Podarke* Ehlers.
ff. Proboscis with a crown of papillae distally.
g. Notopodial setae none or simple .... *Psammate* Sars.
gg. Notopodial setae one in each notopodium, this composite . . *Micropthalmus* Mecznikoff.
ee. Notopodium well developed (proboscis without papillae).
f. Palpi slender, subfiliform, of same form as tentacles .... *Orthodromus* Ehlers.
ff. Palpi thick, much stouter than the filiform tentacles .... *Oxydromus* Grube.
cc. With more than six pairs of tentacular cirri.
d. With seven pairs of tentacular cirri; palpi triarticulate .... *Peribaea* Ehlers.
dd. With eight pairs of tentacular cirri.
e. Parapodia uniramous.
f. Tentacles two or none; proboscis unarmed.
g. Tentacles very widely separated, as far apart as the anterior eyes; blade of composite setae with a distinct subdental process extending toward or beyond the apex of the proximal tooth .... *Hesione* Savigny.
gg. Tentacles nearer together than the anterior eyes; blade of composite setae more strongly bifid, with no subdental process or shield .... *Dalhousiella* McIntosh.
ff. Tentacles three.
g. Proboscis with two maxillae .... *Leocratides* Ehlers.
ee. Parapodia biramous; tentacles three.
Proboscis armed with two maxillae .... *Leocrates* Kinberg.

Synonymy of Genera.

Oxydromus Grube (1853) has as its type *O. fasciatus* Grube; Stephania Claparède (1870), *Nereis flexuosa* Delle Chiaji; and Ophiodromus Sars (1861), *O. vittatus* Sars. These three species are found to be identical, *flexuosa* having the priority. Hence Stephania and Ophiodromus are synonymous with Oxydromus. Gyptis Marion and Bobretzky seems also clearly a synonym of Oxydromus.

Psamathe Johnston (1836), type *Ps. fusca* Johnston, is identical with Castalia Savigny (1820) aside from being preoccupied by Psamathe Raf. (Crustacea, 1814). The name was later written Psammate by Sars. It also seems necessary to eliminate Kefersteinia Quatrefages (1865) since the species upon which based, *Psamathe cirrata* Keferstein, is now considered the same as Johnston's *fusca* (*Cf.* McIntosh, British annelids, 1908, **2**, pt. 1, p. 128). Halimede Rathke (1843) is also the same and is, moreover, preoccupied in the Crustacea (Haan, 1835). Castalia Savigny, the earliest of these names, is unfortunately antedated by Castalia Lam. (Moll., 1819). The next available name is Psammate Sars, a revised form of Psamathe, and is accordingly here used.

Mania Quatrefages is the same as Podarke Ehlers, the supposed difference in number of tentacular cirri being due to error.

Magalia Marion and Bobretzky is synonymous with Syllidea Quatrefages, its type species *perarmata* being identical with *armata* Quatrefages, the type of Syllidea.

Harpochaeta Korschelt (1894) is regarded by Ehlers (Deutsch. tiefsee exped. Valdivia, 1908, **16**, p. 59) as the same as Ancistrosyllis McIntosh.

Lamproderma Grube (1877), type *L. longicirra* Grube from New Britain, seems from the description to be close to if not identical with Psammate.

HESIONE Savigny.

Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 12, 39.
Fallacia QUATREFAGES, Hist. nat. annelés, 1865, **2**, p. 98.
Telamone CLAPARÈDE, Annélides Chétop. Golfe Naples, 1868, p. 231.

HESIONE PACIFICA McIntosh.

Challenger Annelida, 1885, p. 184, pl. 29, fig. 2, pl. 32, fig. 14.

LOCALITY. Society Islands: Bora Bora. Fringing Reef. 17 November, 1899.

A single specimen about 23 mm. long, exclusive of the fully extended and wholly smooth proboscis. The species was described originally from Tongatabu in the Friendly Islands, having been taken off Nufalofa at a depth of eighteen fathoms.

HESIONE GENETTA Grube.

Plate **22**, fig. 7, 8.

Jahresb. Schles. gesellsch., 1866, **44**, p. 63; Annulata Semperiana, 1878, p. 104.

The specimens have the usual sixteen parapodia-bearing somites. A representative specimen is 21.5 mm. long and has a maximum width, exclusive of the parapodia, of 4 mm. The body increases in length to the tenth parapodiferous somite, and then more gradually narrows caudad from the thirteenth or fourteenth somite. The dorsum is moderately arched.

The general color is an iridescent grey of slight yellowish cast. The dorsum of each segment is characteristically marked with dots of deep violet color. The dots on the first segment ordinarily are numerous and closely arranged or confluent in a transverse band across the caudal half. On the other segments there is a triangular patch on each side between the dorsal sulcus and the parapodium, the point of the area being ventrad and a little above base of parapodium. On each somite between the sulci the dots are nearly absent from the anterior half, or with but a few scattered ones present, but form a continuous series across the middle in which the median one is often largest, while in the posterior part the dots tend to leave the series open at the middle and to be largest at the lateral ends. The number of series of dots on each somite is ordinarily three or four, not including the scattered ones present in the anterior region of some. In one small specimen on each somite there is but a single spot on each side above the parapodium and three transversely elongate marks on the dorsum, or these may practically unite into a single transverse stripe. In the smallest specimens there is a solid stripe across the first segment in place of the band of segregated spots of the larger ones. Also on succeeding somites there is but a single series of marks. The marks tend to fade out on the posterior somites. The venter in all is wholly without dark marks.

Parapodia subcylindrical, distally truncate. The neurocirri usually extend near or a little beyond the tips of the setae. The notocirri are long, clearly exceeding the width of the body and the longer ones equal in length to the longest dorsal tentacular cirri, which extend back to the middle of the sixth parapodia-bearing somite. The anal cirri in length about equal to the longer tentacular cirri.

The prostomium is much narrower than the succeeding somite, strongly narrowed forward, triangular in outline, with the apex rounded and the sides more or less bulging in such way that the caudal portion may appear subquadrate, the narrowed anterior portion depressed. In the smaller specimens the prostomium appears more subquadrate; with two short, moderately acuminate tentacles, one arising on each side from a slight notch a little caudad of the anterior end. The caudal margin of prostomium may be distinctly notched. A median longitudinal furrow extends forward from this notch to a distinct, transverse, arcuate sulcus extending between the two posterior eyes and with its convexity forwards, and continues to a second transverse sulcus between or a little in front of the anterior eyes. From the latter transverse sulcus two sulci run forwards and are connected so as to form a small subquadrate area and then continue, each bending out to the base of the corresponding tentacle. The anterior eyes are much larger than the posterior and are much farther apart. All eyes distinct.

The setae, as in several other species of the genus, are of a distinctly greenish color excepting the transparent distal piece. The tip of the distal piece presents the usual tooth below the apex. The subapical tooth proportionately stout, nearer the apex than usual, the lamina not extending beyond the apex of the lateral tooth. (Plate **22**, fig. 7, 8).

LOCALITIES. Paumotu Archipelago: Fakarava. 12 October, 1899. Three specimens.

Paumotu Archipelago: Makemo. Reef flat. 20, 21 October, 1899. Two specimens.

These specimens agree in general with the description by Grube of specimens from Samoa and the Philippines. They seem to be somewhat different, however, in the form of the prostomium and the character of the furrows on its dorsal surface. But the form of the prostomium appears dissimilar in the different specimens and according to age, and especially with slight variation in orientation when studied. Grube's description is not sufficiently exhaustive, however, to remove all doubt as to the identity of the species.

HESIONE PANAMENA, sp. nov.

Plate **22**, fig. 9, 10.

The body consists of nineteen somites, of which sixteen bear parapodia. The length of the type is 40 mm. and its greatest width between bases of parapodia is 6.6 mm., this being at the tenth somite. The dorsum is much less arched than in *H. splendida* Savigny, and also, to judge from descriptions, than in the closely related *H. reticulata* Marenzeller, and the body appears proportionately broader.

Dorsum, excepting the lateral cushions, marked with numerous, cinnamon-colored, longitudinal lines which are interrupted. Anteriorly and as far caudad as the middle is a median dorsal line of this color somewhat heavier than the others and on each side of this are five, or at places incompletely six, broken lines, the color-pattern being thus very like that in *splendida* and in the Philippine form described by Grube as *intertexta*. The distinctly bisulcate venter is, laterad of each sulcus, a dilute cinnamon color of a vague rosy tint. Between the sulci the venter is lighter, obscure yellow, excepting in some parts immediately adjacent to the sulci. The lateral cushion-like region and the parapodia are paler and also with the vague rosy tint excepting the parapodia. The setae are green as in various related species, excepting the distal blades which are nearly colorless.

The prostomium wider than long; sides strongly convex; convexly elevated above, and with a short median longitudinal sulcus at the caudal end which bifurcates anteriorly. Eyes of the anterior pair decidedly larger and farther apart than those of the posterior pair. Antennae broken off in the type.

The peristomium dorsally very short and finely longitudinally wrinkled, while ventrally much longer than usual. The usual eight pairs of tentacular cirri present, of which the dorsal are longer; the second dorsal reaches nearly to the fifth parapodiferous somite.

Parapodia proximally subcylindrical, distally conical, with the end truncate. The eighth parapodium is 1.5 mm. long, this being about the same length as the setae, or the latter but little shorter. The ventral cirri normally extend a little beyond the distal tips of the setae. The dorsal cirri are long, and apparently entire, one of the posterior region exceeding in length the distance between the tips of the setae of the two parapodia of the same somite, though most of the setae present are shorter than this. The anal cirri are of about the same length.

The setae are of the prevailing general type. The subapical tooth is small, often rounded, and inserted above the middle of the distance between attachment of the covering lamella and the tip of the seta. The lamella extends much distad of the tooth, opposite which it is excavated; it is nearly straight excepting sometimes at its tip, and the space between it and the seta proper is always narrow and slit-like. (Plate 22, fig. 9, 10).

The proboscis is not extruded in the type.

Locality. Panama. Shore. 12 March, 1891. One specimen.

This form in general structure and appearance is near *H. splendida* Savigny. Augener (Fauna Südw.-Austr. Polych., 1, 1913, 4, p. 187) gives a wide scope to *splendida*. I believe he includes two or more definitely separable specific forms under that name. Not to mention other differences, an examination of the setae of specimens of *H. splendida* (*sicula* Claparède) from the Mediterranean shows constant differences from those of *H. panamena*, the subapical tooth being decidedly longer and the lamella shorter and not passing beyond the tooth (Plate 22, fig. 11, 12). The figures given by St. Joseph (Ann. sci. nat., 1897, ser. 8, 5, pl. 19, fig. 136) and by McIntosh (Challenger Annelida, 1885, p. 185, pl. 15A, fig. 10) for this species (under the name of

H. pantherina) as found on the coasts of France and at the Cape Verde Islands respectively, agree with my Mediterranean specimens in this regard, so that I think the character must be regarded as constant. Marenzeller's figure of the seta (Sudjapan. Anneliden, 1879, pl. 3, f. 4) of his *H. reticulata* (*Cf.* Plate **22**, fig. 13) shows a form different from that of the real *H. splendida*, as I believe, and that species seems therefore valid. The figures given by Gravier (Nouv. arch. Mus. hist. nat. 1900, ser. 4, **2**, p. 175, 177, fig. 43–45) of the seta of his *H. ehlersi* (*Cf.* Plate **22**, fig. 14) also represent a clearly different form, and I think the species will be found to be valid in spite of an error as to a principal character upon which the separation was originally based.

LEOCRATES Kinberg.

Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 244; McINTOSH, British annelids, 1908, **2**, pt. 1, p. 130.
Lamprophaes GRUBE, Jahresb. Schles. gesellsch., 1866, **44**, p. 65.
Tyrrhena CLAPARÈDE, Annélides Chétop. Golfe Naples, 1868, p. 227.
Dalhousia McINTOSH, Challenger Annelida, 1885, p. 186.

LEOCRATES IRIS (Grube).

Lamprophaes iris GRUBE, Annulata Semperiana, 1878, p. 105; Jahresb. Schles. gesellsch., 1866, **44**, p. 65.

LOCALITY. Society Islands: Papeete. Shore. 9 November, 1899. One specimen.

The species is also known to occur in the Samoan and Philippine regions.

LEOCRATES ANOMALUS, sp. nov.[1]

The body is strongly fusiform and somewhat more narrowed caudad than cephalad. It is widest in the region of the eighth and ninth somites. The somites are shortest at the ends of the body. No dividing lines between somites are indicated on the dorsal surface. Length 17 mm.; greatest width of body proper, 3.25 mm.

The original color rather uncertain. At present the type is of a pearly yellowish grey color, with the dorsum somewhat dusky caudally and laterally and without markings. The venter with a pale median line, bordered on each side by a dark line.

The prostomium in the type somewhat shrunken, appearing subquadrate or even a little wider in front of the anterior eyes than at base. Notched above in the median line at base and longitudinally furrowed in front of the notch, with a sulcus bending out toward each anterior eye and a quadrate figure in front of this outlined by sulci. The unpaired tentacle inserted in the caudal region, as usual, and lying in the median furrow.

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[1] *'νώμαλος*, anomalous.

On each side there are the bases of eight tentacular cirri, all having been broken off so that their lengths cannot be determined; but the bases of the upper ones are much the stoutest, and of these the second from the most posterior is thickest and the most anterior one smallest.

First three parapodia with only neuropodium and neuropodial setae. Those succeeding have, in addition, a notopodium which appears as a tubercle on the dorsal side at the base of the neuropodium, this bearing finer, simple capillary setae in contrast with the usual compound setae of the neuropodium. The cirri are all broken off near the base. The bases of the first four pairs of notocirri are conspicuously thicker than those following and of these the cirri of the first pair are stoutest, being of nearly the same thickness as the largest of the tentacular cirri. Each neuropodium bears an acutely pointed, auriculiform process at its distal end above or dorsocephalad. Most notopodia are narrowed to a point ventrad of the setae.

All setae in the type are colorless and transparent, or nearly so, or in part show a vague and very dilute greenish yellow cast. The capillary setae in the posterior segments are numerous, the notopodial fascicles being large and conspicuous and extending beyond the distal end of the neuropodia. The tips of all the neuropodial setae are missing so that their structure could not be determined.

The proboscis, unlike that of other species recorded from the Indo-Pacific region, presents near its distal rim, when extended, a half circle of conspicuous, chitinized, rounded papillae, these forming a half-crown across the dorsal half of the proboscis with none on the ventral half. The papillae are ten in number.

Locality. Marshall Islands. A single specimen came up on anchor from a depth of 12 fms. Albatross Exped. 1899–1900.

This form is characterized chiefly by the half-crown of chitinous papillae at the end of the proboscis, a character seeming at once to separate it from the preceding and from other species of the region.

Nereidae.

This is one of the most homogeneous and clearly defined families of the Polychaeta, the characteristic and obvious structural appearance ordinarily making possible their easy recognition. The body is elongated and cylindrical, or but moderately depressed. The somites are numerous and in the ordinary or atokous stage all are similar, excepting the usual modifications in the terminal ones.

The prostomium is distinct and well formed. It bears two pairs of eyes, or these may rarely be absent. There is one pair of tentacles, and a pair of palpi which are characteristically massive and two-jointed, with the terminal joint short.

The peristomium bears two pairs of tentacular cirri and may rarely bear parapodia and setae also.

The parapodia in general are biramous, though the most anterior one or two pairs may be uniramous and the most posterior ones may be modified from the prevailing type. The notopodium is occasionally rudimentary (Namanereis and Lycastoides). Notocirri and neurocirri present.

The setae are composite and occur in two forms as to the character of the articulation, namely the unsymmetrical, or heterogomph, and the symmetrical, or homogomph, types. Usually both kinds occur at the same time, but not always, one type in some forms prevailing exclusively. Stout spines, or crochets, rarely present (Uncinereis, gen. nov.).

The nephridia consist of long, convoluted tubules, each of which ends internally in an open ciliated funnel, or nephrostome.

The pygidium in general bears two anal cirri.

The proboscis in extrusion presents two distinct regions or rings, a distal, or maxillary, ring and a basal one. Each of these is again more or less clearly divisible into six areas, three dorsal and three ventral, which are indicated in descriptions as follows:— the median dorsal maxillary area is I, each lateral dorsal maxillary area II; the corresponding ventral areas of the maxillary ring, III and IV respectively; the corresponding areas on the basal ring above are V and VI, and below VII and VIII. The proboscis always bears distally a pair of maxillae curved toward each other and dentate on the mesal edge. The surface of the proboscis otherwise may be smooth, or it may bear upon all or part of the areas small, soft or hard papillae, or teeth, the paragnatha, which are of much significance in classification.

While some species of nereids reproduce without changing their ordinary asexual body-form, many more undergo a pronounced metamorphosis affecting both the external and the internal structure at the time of sexual maturity and at the same time assume a pelagic life. The epitokous form, in general, is spoken of as the "heteronereis" stage. Heteronereis was erected as a genus by Oersted (Annulatorum Danicorum conspectus, 1843, p. 19) for epitokous forms of Nereis under the assumption that they were independent of any other known forms. In the metamorphosis into the heteronereis form the eyes increase in size, often to a marked degree, the prostomium may become indistinguishable though sometimes becoming otherwise modified, and the palpi commonly undergo a more or less pronounced reduction. At the same time the body becomes marked off into two regions differing strongly in the appearance of the parapodia of the two parts. Of these the anterior, or so-called nereid division, which is comparatively short, retains parapodia of the ordinary form, while the posterior or heteronereid division has parapodia conspicuously modified. These commonly bear special foliaceous lobes and numerous, large, special, natatory setae. The sexual products arise in the posterior division where they may remain, giving it a darker and more opaque appearance contrasting with the commonly colorless and often transparent anterior region, or the products in other cases crowd forward into all the somites. Between the epitokous male and female a sexual dimorphism exists which is often very striking. Differences between the two forms are noticeable, particularly in the tentacles, palpi, and cirri, and sometimes in the prostomium (*Cf. Platynereis polyscalma,* sp. nov. p. 219). The genus Eunereis of Malmgren, which has proved valid, was based upon the epitokous form of *E. longissima* Johnston; and Naumachius Kinberg and Hedyle Malmgren were apparently based upon the epitokous forms of species of Pseudonereis. The real relationship of the heteronereis was first established by Malmgren (Zeitschr. wiss. zool., 1869, **19**, p. 466) in *Nereis pelagica.* One and the same species may exhibit both a smaller, active, pelagic epitokous form and a larger, sedentary heteronereis which remains in a tube on the bottom, as has been well established *e.g.,* in *Nereis dumerili* (*Cf.* Westinghausen, Mitth. Zool. stat. Neapel, 1891, **10**; Mesnil and Caullery, Ann. Univ. Lyon, 1898, p. 146, ff.). It may also happen that a species may at one time reach sexual maturity without undergoing any metamorphosis, while at other times in passing into the epitokous stage it undergoes the change into the heteronereis. Viviparity, as an occasional but probably not necessary phenomenon, has been established for some species, such as the hermaphroditic (proterandrous) *Nereis diversicolor.*

The nereids are essentially littoral animals, occurring mostly between the tide-marks or at but moderate depths, though sometimes found down as deep as 1,525 fms. (*e.g., Nereis longisetis*). They commonly construct tubes in the fissures in rocks or under stones, in the mud in the eel-grass stretches, and in sponges or the stalks of decaying sea-weeds. They are not infrequent in the coralline and laminarian regions. As a rule they rapidly reform their commonly thin, transparent and often collapsible tubes when released in an aquarium. While most nereids are strictly marine, some may live in brackish and even in fresh water, such being the case with most of the species of Namanereis (commonly designated Lycastis). A species of the closely related genus Lycastoides, *L. alticola* Johnson, was found in a fresh water stream of southern California at an altitude 7,000 feet above sea-level (*Cf.* Ehlers, Nach. K. gesselsch. wiss. Göttingen. Math. phys. klasse, 1897, p. 70; Gravier, Bull. Soc. hist. nat. Autun, 1901, **14**, p. 29; Johnson, Mark anniversary vol., 1903, p. 210). Some forms are commensal, such as *Nereis fucata* and others which live with the hermit-crab in shells of Buccinum, etc. (*Cf.* McIntosh, British annelids, 1910, **2**, pt. 1, p. 259; Harrington, Trans. N. Y. acad. sci., 1898, **16**, p. 214).

Some nereids live largely upon Algae, such being the case with *Nereis cultrifera* Grube and *N. pelagica* Linné. In addition the members of the family feed upon small ova, sponges, Crustacea, and also upon other annelids.

Key to Genera.

a. Tentacles arising from a very long common basal article inserted anteromesally on the prostomium. (Pelagic form) . . . . *Kainonereis*, gen. nov.
aa. Tentacles with no such common basal article.
  b. Proboscis with no paragnatha.
    c. Nereids with dendritic branchiae . . . . *Dendronereis* Peters.
    cc. With no dendritic branchiae.
      d. Notopodium rudimentary.
        e. Prostomium anteriorly deeply incised; tentacular cirri on each side arising from an elongate common basal article . . . . *Lycastoides* Johnson.
        ee. Prostomium anteriorly not thus deeply incised; tentacular cirri not arising on each side from a long common basal article . . . . *Namanereis*, gen. nov.[1]
      dd. Notopodium well developed.
        e. Peristomium with parapodia and setae . . . . *Micronereis* Claparède.
        ee. Peristomium without parapodia or setae . . . . *Leptonereis* Kinberg.
  bb. Proboscis with paragnatha.
    c. Paragnatha all soft (papillae).
      d. Setae of two kinds; eyes none . . . . *Chaunorhynchus*, nom. nov.[2]
      dd. Setae all of one kind, homogomphs; four eyes present . . . . *Tylonereis* Fauvel.
    cc. Hard, chitinous or callous paragnatha present.
      d. Paragnatha all simply hard or callous . . . . *Tyllorhynchus* Grube.
      dd. Horny or chitinous paragnatha present.
        e. Both chitinous and soft paragnatha present . . . . *Leonnates* Kinberg.
        ee. Paragnatha all chitinous.
          f. Paragnatha conical, all separated from each other.
            g. Paragnatha occurring on both rings of the proboscis.

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[1] *νᾶμα*, a stream or spring, in allusion to the occurrence of most species of this genus in fresh and brackish water.

[2] *Pro* Ceratocephale or, as commonly, Ceratocephala, Malmgren, preoccupied in Crustacea. *χαυνος*, gaping, flaccid, and *ῥύγχος*, snout.

h. Paragnatha present on all eight areas.......................*Neanthes* Kinberg.
hh. Paragnatha absent from one or more of the areas.
i. Groups I, II, and V lacking..............................*Cirronereis* Kinberg.
ii. Group V, or V and VI, lacking..............................*Nereis* Linné.
gg. Paragnatha present on only one ring of the proboscis.
h. Present only on the maxillary ring........................*Ceratonereis* Kinberg.
hh. Present only on the basal ring..........................*Eunereis* Malmgren.
ff. Paragnatha not all conical and at the same time well separated.
g. Paragnatha all of one form, very small, and arranged in dense series or pectinae. (Groups I, II, V, and sometimes VI, VII, and VIII lacking.)
h. Stout crochets present in all but the most anterior notopodia in addition to the ordinary setae....................................*Uncinereis*, gen. nov.
hh. No crochets present.
i. Group I lacking..*Pisenoe* Kinberg.
ii. Groups I, II, V, and sometimes VI, VII, and VIII lacking..*Platynereis* Kinberg.
gg. Paragnatha of two or three forms, conical and transverse, or else these and in addition the pectinate type.
h. Of two forms, conical and transverse, separated.
i. All groups present...................................*Perinereis* Kinberg.
ii. Group V lacking..*Areta* Kinberg.
hh. Of three forms, conical, transverse, and pectinate..........*Pseudonereis* Kinberg.

Synonymy of Genera.

Numerous other generic names have been proposed; but nearly all of them must be included in those designated in the analysis above. Until their type-species shall have been restudied it must remain impossible satisfactorily to place Typhlonereis and Phyllonereis of Hansen and Nossis of Kinberg. Not a few species have been so inadequately described that it is now difficult or impossible to identify them generically. Unless some other characters than those presented by the proboscis and its armature shall be found it may become necessary still further to combine some of the genera recognized here, since variations in the arrangement and even in the form of the paragnatha are considerable in some species, particularly between smaller specimens and the fully grown ones (*Cf*. Ehlers, Festsch. K. gesellsch. Göttingen, 1901, p. 112) discussion under *Nereis variegata* Grube which he identifies with *Mastigonereis podocirra* Schmarda, *M. longicirra* Schmarda, *Paranereis elegans* Kinberg, *Nereis obscura* Hansen, *N. coerulea* Hansen, *N. micropthalma* Hansen, *N. stimpsonis* Grube, *N. ferox* Hansen and *Naumachius pannosus* (Grube) Kinberg.

Since Ehlers, from a study of type-specimens and more abundant new material, finds *pannosus* of Grube, as identified by Kinberg and by him made the type of Naumachius, to be identical with *elegans* Kinberg, the type of Paranereis, these two genera must be merged; and since they in turn cannot be kept distinct from Pseudonereis, all three must apparently be combined. Of these Pseudonereis has the priority. Naumachius appears to have been based on the epitokous form.

Hedyle Malmgren was also based upon an epitokous form of a species of Perinereis. Included under Perinereis are also Malmgren's genera Lipephile and Stratonice. Nereilepas and Hediste have by some authors been so conceived as in part to cover this genus; but their types carry them to Nereis. Arete Kinberg is kept apart here tentatively but is quite likely also to have to be included; and Perinereis may in turn possibly have to be united with Pseudonereis.

Leontis Malmgren and Iphinereis Malmgren (based on the epitokous stage) are the same as Platynereis Kinberg.

Nicon Kinberg and Nicomedes Kinberg are synonymous with Leptonereis, the former also being preoccupied (Gray, Mammals, 1847). Alitta Kinberg is regarded as not differing generically from Neanthes Kinberg.

Lycastis Savigny (Descript. Egypte. Hist. nat., 1809 [= 1822], 1, pt. 3, p. 45) was proposed for *Nereis armillaris* O. F. Müller; but as this species proves to belong under Syllis in the Syllidae, the nereid generic group to which Lycastis has long been applied remains without a name. To supply the lack Namanereis is proposed with *N. quadraticeps* Gay as the type.

KAINONEREIS, gen. nov.[1]

Prostomium short and narrow, narrowed cephaloventrad. Tentacle long, single, bifid at tip, varicose or annulated (male). Palpi reduced; biarticulate; with proximal article stout, the distal more slender and soft.

Four eyes, large, the two of each side close together, the anterior more lateral in position, the posterior more dorsal and on caudal region of prostomium.

Nuchal organs simple, ciliated pits.

Peristomium with four pairs of tentacular cirri which are varicose or annulated (male).

All parapodia biramous, each branch supported by a single, stout aciculum. Dorsal branch with two ligulae, the ventral with one. Setae all compound. Shafts strongly cross-striate. Neuropodial setae of anterior, or nereis region, falcate and setose. The notopodials in the anterior part of this region coarser and darker, with the distal piece short and distally blunt. Both dorsal and ventral cirri present. The notocirrus in anterior region expanded proximally and on some with the expanded region very large (fifth, sixth, and seventh pairs in type), forming elytra-like organs. Both notocirri and neurocirri in the heteronereis region with foliaceous expansions proximally. In this region also a special, additional foliaceous appendage at tip of the neuropodium and all setae replaced by the larger, paddle-shaped swimming setae.

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[1] καινὸς, unusual, and Nereis.

Anal cirri two; annulated.

Alimentary canal straight. Oesophagus with a pair of caeca.

Genotype.—*K. alata*, sp. nov.

This form is unquestionably very close to Nereis to which its precise relationship can be decided only when the other phases of the type-species are known. It is given separate generic rank here chiefly because of the highly peculiar, long, single process bifurcate at the tip and which may be morphologically double or else may represent an extremely elongate anterior division of the prostomium, bearing at its tip the two short tentacles; and the elytriform developments, possibly peculiar to the male, on three of the anterior pairs of parapodia, though special developments of parapodial structures are not infrequent in the family. One form of the anterior notopodial setae is quite special, but by itself would scarcely be regarded as of more than specific value. The reduction in size of the palpi is not infrequent in the males of Nereis.

Kainonereis alata, sp. nov.[1]

Plate **28**, fig. 6–8; Plate **29**, fig. 1–8.

Epitokous or Heteronereis Phase.

Body-wall colorless and transparent, but the body contents in part giving a brownish tinge. Appendages colorless. Setae colorless and transparent.

The body is widest near the middle of the length, from where it narrows caudad to a point and cephalad to a much narrower anterior region consisting of five somites in front of the elytrophorous ones. These anterior somites narrow more gradually toward the cephalic region. A typical specimen, 10.5 mm. long, which seems to be about the average, consists of fifty-six somites.

The prostomium is short and narrow, clearly deeper dorsoventrally than either the length or the width. The dorsal surface anteriorly between the anterior eyes is raised into a conspicuous, low, subconical, distally rounded elevation which bears at the top two small, transparent, secondary eminences or knobs. It may also be elevated at the posterior end above between the posterior eyes. The anterior surface is incurved at about the middle height above, bulging out below this and extending into the long single tentacle. This tentacle seems to correspond to the usual paired tentacles since it is bifurcate at the tip. The tentacle is a little less than three times as long as the prostomium is high. The bifurcation at the tip is somewhat variable, but never exceeds one fourth the total length. The tentacle increases in thickness proximad. It is distinctly annulated or jointed throughout its length, the joints short and numerous. The palpi arise on the ventral surface immediately in front of the mouth and project a little caudad of ventrad. Each in length is about equal to the height of the prostomium and is conspicuously biarticulate, the proximal joint thicker and stouter, with sometimes faint signs of a secondary joint proximally. The distal joint is elliptic in outline, narrowly rounded distally. There are two pairs of eyes. Of these the posterior ones are dorsolateral in position, each occupying a caudolateral corner of the prostomium, with their axes directed ectodorsad. They are nearly circular in outline and are about their diameter apart. The anterior eyes are situated on the sides of the prostomium, each cephaloventrad of the corresponding posterior eye and with the axis directed ectad. They are decidedly smaller than the posterior ones and are less circular in outline, being broadly obovate to subelliptic. All eyes are very strongly convex. (Plate 28, fig. 6).

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[1] alatus, winged.

The peristomium is decidedly longer than the prostomium and also clearly exceeds the second somite. It is wider than the prostomium and projects much below it. The border of the mouth is crossed radially by impressed lines or wrinkles. There are four pairs of tentacular cirri, all those of each side being attached close together between the eye and the mouth. The dorsal anterior cirrus is largest of the four. It is in length but little longer than the tentacle and reached to the fourth somite or, in some, only to the third. The anterior ventral tentacular cirrus is much shorter; but it is stouter and somewhat longer than the posterior ventral which, in turn, is longer than the posterior dorsal which seems normally to differ in being of more uniform diameter and blunt distally. The style of each cirrus is constricted at the base and attached through the medium of a short, narrow cirrophore. The cirri are all annulate or varicose and all, except possibly the dorsal posterior ones, are conspicuously pointed distad. A small, simple nuchal pit occurs on each side back of the eye and close to the base of the upper posterior tentacular cirrus. (Plate 28, fig. 6).

The succeeding or normal setigerous somites are all sharply separated from each other. The anterior four or five are particularly highly convexly arched above, and are also convexly but less strongly arched below. In the middle and posterior regions the arching is proportionately less strong. The second somite is two thirds as long as wide, essentially the same proportions being maintained also in the next five somites. The seventh somite widens from in front to the caudal end. The eighth somite is typically proportionately abruptly shorter, being but one half as long as wide, while the ninth is about two and a half times wider than long. The pygidium is small and bears two anal cirri. Each anal cirrus has a distinct, thicker cirrophore, upon which is borne the style. The style is short, when laid along the body reaching to the fourth somite from the caudal end. It is moderately tapered distad and is constricted at the extreme base. It is strongly annulate like the other cirri. (Plate 28, fig. 7).

The parapodia are attached laterally near the middle of the height. On the most anterior somites they are attached at the anterior end, but caudad they gradually shift to a middle position. The first eleven pairs of parapodia are contrasted with the others in being shorter and, in preserved specimens, at least, in projecting more directly ectad, the larger posterior ones projecting caudad of ectad, in not bearing foliaceous appendages on the neuropodia, and in their setae. The anterior parapodia differ in length among themselves, becoming progressively shorter in proceeding from the thirteenth forward to the first pair. All parapodia are biacicular and biramous, with each branch terminating in one or two special finger-like processes, and bear notocirri and neurocirri. In the short anterior parapodia the notopodium is a little reduced. Its two distal digitate processes are short and slender. One of these, the more dorsal, is in connection with the aciculum. The setae are few and of a special type. The neuropodium shows two short terminal processes, from one of which the setae arise and into which the aciculum extends without protruding through the surface; the second process is on the ventral side. The neurocirrus is attached on the ventral side at the very base; its cirrophore is thick and short; the style above its constricted base short and narrowly conical and not attaining the end of the neuropodium. The notocirrus arises on the dorsal side near the middle of the length from a very low elevation, or cirrophore; its style is narrow at the base, expanding at the middle into a small lamellar structure from one side of which a slender, pointed, finger-like process extends. (Plate 29, fig. 4). The parapodia of the fifth, sixth, and seventh pairs are strikingly differentiated from the others in having the dorsal expansions on the notocirri greatly enlarged to form broad, subcircular elytra, the finger-like process itself being also much thicker than in the notocirri of other parapodia. (Plate 28, fig. 9; Plate 29, fig. 2). In the notopodium several of the special stout setae appear, while the number of the ordinary composite setae in the neuropodium increases. In the somites immediately following the seventh the elytra-like expansions of the notocirri are again lacking, but the notocirri undergo further progressive modifications, coming to appear as a thin membranous wing along the parapodium, with at the distal end a distinct, finger-like process, while the proximal end of the membrane is also free for a short distance; the acicular process at the end of the notopodium and the other finger-like appendage become longer and about the same in size as the process on the neuropodium. The setae of these notopodia following the seventh are the same as those of the neuropodium, the special coarse setae being abruptly replaced. The neuropodia of the eighth, ninth, and eleventh parapodia remain nearly the same as in the more anterior ones. (Plate 29, fig. 3). In the twelfth the setigerous process bears at the distal end a thin, membranous, leaf-like process which on the thirteenth becomes much larger and narrowly subovate, with the distal end rounded. In the latter, too, the neurocirri have become proximally membranous, with a slender, cylindrical, distal process, at one or both sides of the base of which is a low, rounded process often giving the neurocirrus the appearance of being doubled. (Plate 29, fig. 4). In the fourteenth and fifteenth parapodia the membranous appendage to the neuropodium has become still larger and reaches nearly to the ends of the shafts of the setae; it is very finely veined. The notocirral fringe becomes larger, the proximal end free as an angular, distally narrowly rounded lobe, while the distal process is more elongate; it lies commonly close against the large, non-acicular, notopodial process proximally. At the base of this finger-like, terminal notocirral process there are two, slight, rounded lobes on opposite sides. This is the typical form of parapodium prevailing throughout the remaining portion of the body. (Plate 29, fig. 5). In the caudal region the parapodia become reduced in size, but the same structures remain evident and retain the natatory setae throughout. The terminal neuropodial membrane is usually somewhat obliquely subtruncate across the distal end, with a small mucron at the middle.

Two acicula in each parapodium, one in each branch. These are black and conspicuous, finely pointed distad, each extending into a special acicular process. The setae are all compound, but are of three distinct primary types. The notopodial setae of the first seven pairs of parapodia are of a special type. (Plate 29, fig. 7). They are black or dark brown in color like the acicula. The shaft is gently doubly curved and terminates distally in a deep socket of homogomph form bent a little to one side. The shaft is strongly cross-striate throughout its length. The terminal piece is short and distally blunt or rounded, and a little notched on each side toward the base where the corresponding edge of the socket meets it, the piece being thus loosely clamped in place. Along one side it is closely, finely setose. In the most anterior parapodia these setae may not be above two in number, but the number increases to three or four in the parapodia bearing the elytra. Behind these the dark special setae just described are replaced by setae like those of the neuropodia. (Plate 28, fig. 8). These are colorless and transparent and are clearly more slender than the dark anterior notopodials. The shaft is more strongly curved distad and ends in a socket that is more asymmetrical, one of its sides rising considerably higher than the other, but still more conformable to the homogomph than to the heterogomph type of Claparède (Annélides Chétop. Golfes Naples, Suppl., 1870, p. 42). The distal end of the shaft is a little clavately enlarged. The shaft is strongly cross-striate, the striations commonly in two contiguous bands. The terminal piece is narrow, moderately short, and narrows to an acute tip. It is closely, finely setose along one edge. It varies in length, that of the most dorsal ones in the series being longest. While the neuropodial setae in the anterior parapodia much exceed the notopodials in number, behind the elytra the notopodials increase in number until they much exceed the neuropodials in the posterior part of the anterior series and in some succeeding oens of the second series. Beginning with the twelfth parapodia, this second type of setae is abruptly replaced both on notopodia and on neuropodia by a third type differing especially in being larger and in having the terminal piece much larger and broader, more paddle-like, widening from the base to distad of the middle, and then again narrowing to the acute or subacute tip. The terminal piece along one edge is very finely and shortly serrate. (Plate 29, fig. 6). Some of the notopodials, *e.g.*, those of the twelfth parapodia, have much shorter terminal pieces, which, however, are the same in structure as the others; they are in the more dorsal position. The number of setae, both neuropodial and notopodial, much increases toward the middle of the body, where also inequality in the number of setae in the two rami becomes less or not at all noticeable.

The pharynx is straight. The oesophagus is similarly straight. It is abruptly much narrower than the pharynx and bears at its anterior end the usual pair of simple caeca. (Plate 29, fig. 8). The proboscis in no case is extended. The jaws are colorless, relatively long and slender, each with eight teeth. Other armature was not detected in the specimen dissected.

Locality. Gilbert Island: off Apaiang. Surface, by electric light. 3 January, 1900. About twelve specimens.

All of the type-specimens as preserved are flexed into a semicircle, with the concavity dorsal. The strongly narrowed anterior region, with the three pairs of large elytra, give to this form a very characteristic appearance. Aside from the peculiar tentacle, the form of the notopodial setae of the most anterior parapodia seems to be especially distinctive.

Nereis Linné.

Syst. nat. ed. 10, 1758, **1**, p. 654; Cuvier, Règne anim., 1817, **2**, p. 524; Audouin & Milne Edwards, Hist. nat. litt. France. Annélides, 1834, **2**, p. 181; Ehlers, Borstenwürmer, 1868, p. 450; St. Joseph, Ann. sci. nat., 1897, ser. 5, **8**, p. 285; McIntosh, British annelids, 1910, **2**, pt. 2, p. 267 (in part).

Lycoris Savigny, Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 29.

Nereilepas Blainville, Dict. sci. nat., 1828, **57**, p. 469.

Heteronereis Oersted, Annulatorum Danicorum conspectus, 1843, p. 19.

Mastigonereis Schmarda, Neue wirbellose thiere, 1861, **1**, p. 107.

?*Johnstonia* Quatrefages, Ann. sci. nat., 1849, ser. 3, **12**, p. 304.

Thoosa Kinberg, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 172.

Hediste Malmgren, Annulata Polychaeta, 1867, p. 48.

Praxithea Malmgren, *Op. cit.*, 1867, p. 50.

Nereis segrex, sp. nov.[1]

Plate **32**, fig. 3–5.

General color yellowish, without markings. The tentacles and cirri are whitish.

The type is incomplete caudally. The portion present consists of thirty-eight somites. It is 22 mm. long and has a maximum width, exclusive of parapodia, of 3.2 mm., and inclusive of parapodia, of 4.6 mm., while to the tips of the setae, the width is 6.3 mm. The body is widest anteriorly at about the sixth somite, from where it narrows continuously caudad and also cephalad to the second somite, which is narrower than the peristomium. The body is also highest in the region of the greatest width.

The prostomium in general outline as seen from above is roughly triangular. It presents a short protrusion between the palpi which is truncate and bears the tentacles. The dorsal surface in general is weakly and evenly convex excepting for a shallow and wide median depression anteriorly. There are no traces of pigmented eyes, but colorless convex areas apparently represent them. Of these the anterior ones are much the larger. The palpi are very thick and extend forward nearly as far as the tentacles. Each is attached obliquely along the side of the prostomium, the surface of attachment extending from base of the prostomium to within a short distance of its distal end. The basal article is weakly conically narrowed toward its end, where it is truncate. The distal article is abruptly much narrower and is subcylindric and short. The median anterior extension of the prostomium is a little constricted or grooved a short distance proximad of its distal margin. The tentacles, though not contiguous, are attached close together and project directly cephalad. They are subulate and wholly smooth.

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[1] segrex, separated from the flock or company.

The peristomium above is somewhat more than two thirds the length of the prostomium and one and a third times as long as the second somite. It is narrowest across its caudal end. The lower half of the somite, from the middle of each side across to that of the other, forms a thickened lower lip which is crossed longitudinally by numerous deep sulci. The dorsal part of the ring is smooth, or nearly so. On each side a somewhat semicircular lobe from a deeper level projects cephalad against the base of the palpus and bears the tentacular cirri. Each tentacular cirrus has a very short, relatively thick cirrophore, the style being slender and subulate and wholly smooth. All of the tentacular cirri are short. Each anterior ventral cirrus is attached at the anterior margin of the cirriferous lobe, and when laid back reaches only upon the peristomium itself or barely to the anterior border of the second somite. It projects normally ectoventrocephalad. The anterior dorsal cirrus is attached immediately dorsad of the ventral, their cirrophores being contiguous at base, and projects a little ectad of dorsad. When laid back along the body, it reaches to the third somite. The posterior dorsal, which is attached just dorsad of the ventral, has a cirrophore longer than that of the others and reaches back upon the fourth somite.

The metastomial somites are all essentially undivided, though in the middle region of the body they may show a shallow and rather wide transverse furrow that curves caudad at the ends in crescentic manner and separates off a caudal, more elevated, region. On each side above the base of the parapodium, the somite is elevated in a glandular area not present on the most anterior somites and in the more caudal ones becoming more elongate and narrow. The somites are strongly arched above and are flattened ventrally, where they show a distinct and rather deep neural furrow excepting on the first few. The somites increase in length caudad to the sixth, when they decrease and quickly attain a length that is uniform over the remaining part of the type.

A typical parapodium is strongly flattened in the direction of the long axis of the body, is deep dorsoventrally and of moderate length. It presents four subconical lobes, of which the two submedian ones project distinctly farther distad than the others. The dorsal lobe presents a swollen basal region of considerable size, from the dorsal edge of which the slender notocirrus arises and from the anterior side of which the large, basally much inflated, distally conical, process extends forwards. The notocirrus, which is slenderly tapered distad, extends to or, more commonly, clearly beyond the distal end of the main conical dorsal lobe. The ventral lobe arises near the base of the parapodium, extending first ventrad and then bending distad at right angles to its basal portion. It is subconical, but is more or less abruptly reduced in diameter near the middle of its length. The neurocirrus is attached at the extreme base of the parapodium, extending ventrad in the narrow space between the ventral lobe and then curving distad. It is slightly more slender than the notocirrus. The notopodium is a short lobe having an oblique distal surface, with the lower angle protruding distad into a conspicuous conical process, at the dorsal edge of the base of which the aciculum emerges. This lobe extends as a low ridge or presetal membrane, a slighter one being present as a postsetal lobe. The neuropodium is a little less thick than the notopodium. At the distal end it is similarly produced into a conical lobe caudoventrad of the setae. The aciculum extends into the upper part of the process, emerging from its dorsal surface. The expansion of the dorsal lobe from which the style of the notocirrus arises becomes reduced in the most anterior parapodia, in the first pair appearing as an ordinary cirrophore. (Plate 32, fig. 5).

There are two acicula in each parapodium, one in each ramus. They are dense black in color, and taper to a slenderly acute tip. The neuropodial aciculum curves conspicuously ventrad, entering the distal neuropodial process and running beneath its dorsal surface to the point of emergence. The notopodial aciculum curves dorsad, emerging at the base of the distal process. The setae of the neuropodial fascicles are much more numerous than those of the notopodial and are obviously longer. The setae are all compound and are of two types. The notopodials are all of one type. These have slender shafts which are strongly finely cross-striate, or camerated, and end in slightly widened, symmetrical, or homogomphus, sockets. The apical piece, or blade, is long, tapering to a fine tip, and is fringed densely along one margin proximad of the smooth tip. In the neuropodium the more numerous setae are of the same type as those of the notopodium; but in the ventral part of the fascicle are a number of setae of a second type. These have stouter but similarly strongly camerated shafts ending in unsymmetrical, or heterogomphous, sockets. The blade in these heterogomphs is short. It ends in a slender, short, distally narrowly rounded end region which is not dentate, proximad of which along one margin it is densely fringed. (Plate **32**, fig. 4, 5).

The proboscis is but little extruded, making a detailed account of the number and arrangement of the paragnatha impracticable. Of the areas of the oral ring, V and VI are wholly unarmed; VII bears small, nodular paragnatha irregularly transversely arranged across its extreme distal end; each area VIII lacks paragnatha excepting a few in the portion contiguous with VII, from the group on which they are not separated and might be regarded as belonging with them rather than on VIII. All maxillary areas seem to bear a few paragnatha. These are longer and more conical than those of the proximal ring. They are few in number and isolated from each other.

Locality. Off Isthmus of Panama, 72 m. S. W. of Mariato Point: Sta. 4631 (lat. 6° 26′ N., long. 84° 49′ W.). Depth 774 fms. Bottom of green sand. Bottom temp. 38° F. 3 November, 1904. One specimen.

Aside from the distinctive nature of the arrangement of the paragnatha, a characteristic feature of this species is the uniformity in character of the parapodia, with the much enlarged proximal or cirrophorous region of the notocirrus and the much inflated dorsal lobe in front of it. In side view these enlargements in their relation to the cirrus appear much like those of some species of the Alitta (Thoosa) group of Kinberg, excepting that they are not foliaceous. The non-pigmented condition of the ocular areas may be a normal and degenerate state in the species.

Nereis leuca, sp. nov.[1]

Plate **32**, fig. 6–8; Plate **33**, fig. 1–6.

Epitokous Male (*Heteronereis*).

Body colorless and transparent throughout, excepting the eyes, which are black as usual, though the posterior division of the body appears somewhat darkened from its contents.

Total length 16 mm. Greatest width, exclusive of parapodia, 1.5 mm. The nereid and heteronereid divisions are sharply distinguished as usual, the heteronereid division the longer. The nereid division consists of seventeen somites of which sixteen are setigerous, the heteronereid of about sixty, giving a total of nearly seventy-seven. The anterior division is of uniform width from its caudal end to the middle, from where it narrows a little forward to the prostomium. The posterior division is widest near its anterior end from where it narrows uniformly to the caudal end.

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[1] λευκός, colorless.

The prostomium is quadrangular with a much narrower median process extending forward in front of the eyes. It is wider than the total length in about the ratio eight to seven. The preocular process has above a shallow, median longitudinal furrow. The four eyes are equal and moderate in size. Those of the two pairs are the same distance apart and the two of each side are contiguous. The lens of each anterior eye is directed dorsocephaloectad, that of each posterior one dorsocaudoectad. The tentacles are attached on the lower border of the preocular lobe and project cephaloventrad. They are slenderly subulate. The palpus is attached caudoectad of the corresponding tentacle, below the angle at the junction of ocular and preocular divisions of prostomium, and projects a little cephaloectad of ventrad. The proximal article is long and thick, a little compressed, so as to present an elliptic cross-section; the apical article is small and distally rounded. (Plate 33, fig. 1).

The peristomium is, as a whole, shorter than the succeeding somite. It is divided by a distinct transverse furrow as in *caenocirrus*; the anterior division is the shorter, is again divided by a secondary furrow and is mesally usually convex, but does not project over the prostomium as it does in *caenocirrus*. The tentacular cirri are all comparatively short, slender, gradually tapered, and closely jointed or varicose. Of the four pairs the posterior dorsals are longest, but reach only to the fifth or beginning of the sixth somite. The posterior ventrals and anterior dorsals are equal in length, reaching to the third somite. The anterior ventrals are shortest, reaching only to the second somite. The tentacular cirri are attached in the usual places. (Plate 33, fig. 1).

The metastomial somites of the nereid division of the body are dorsally high and convex; ventrally the arch is lower and mesally flattened and with a rather deep neural furrow. They are smooth and entire. These somites increase in length to near the fifth, after which the length remains uniform or nearly so. In those of the middle and posterior parts of the division the width is three and three fourths to four times the length. In the heteronereid division the somites are more compressed dorsoventrally and are shorter and more closely arranged. The pygidium is very small, somewhat trapeziform in outline, with the caudal margin notched. No cirri are present in the type.

The parapodia of the nereid division are of the common general form, short, deep dorsoventrally, and in anterocaudal diameter narrowing distad. The parapodia increase gradually in length caudad; but the relative sizes of the two rami remain essentially the same. The rami short, the notopodial with two short ligulae, the neuropodial with one. In the character of the notocirri the anterior parapodia fall into two groups, as usual. Those of the first group, consisting of but the first five pairs instead of the more usual seven, bear specially modified notocirri, each of these presenting a thick, subcylindrical body narrowing at base and again abruptly distad to pass into a slender apical style or tip. The remaining anterior parapodia have notocirri of the usual type, the styles much more slender and tapering gradually from base to tip. In all cases the notocirri are attached close to the distal end of the notopodium, both in the anterior and in the posterior group. As to the neurocirri, there are not two such sharply defined groups as are frequently present. The first two pairs are slightly more swollen at base than the others, but the transition is not so abrupt as usual. The neurocirri are all attached at base of neuropodia which they exceed in the anterior pairs. They become relatively shorter in going caudad. The parapodia of the heteronereid division are characterized, as usual, by their greater length, which increases to the middle region of the division, again gradually shortening caudad, by their greater relative thinness in the caudocephalic direction, and especially by the laminate developments and the long natatory setae. The notopodium is larger than the neuropodium and the sinus between the two is rather deep. All the laminae are relatively smaller than usual. The two ligulae of the notopodium have the usual relative size, form, and position, the dorsal one being narrowly lanceolate, the ventral one, attached by its edge on the ventral side of the ramus, is larger, distally acuminate, and presents a distinct auricle proximally. Both laminae are much shorter than the shafts of the setae, extending but little distad of the middle of the latter. The principal lamina of the neurocirrus is narrowly subovate, distally narrowly rounded, with the usual small auricle on each side proximally, the two auricles asymmetrically placed with reference to each other. The dorsal neuropodial ligula is small and more of the form of an ordinary style, being constricted at base and narrowed to a point distad. It curves distad close to the edge of the large lamina. The notocirrus is slender, tapered to a fine tip. It exceeds the laminae, reaching to or beyond the ends of the shafts of the setae. On the dorsal side of its base it bears a small, semicircular lamina attached at one side. It is rather vaguely pseudojointed, but bears no distinct papillae along one side. The neurocirrus is smaller than the notocirrus and similarly slender. It bears the usual lamina on each side of its base. (Plate 33, fig. 2–4).

The acicula are two and have the ordinary form and coloration, black or nearly so, excepting for a colorless proximal portion. Only the notopodial aciculum is normally developed in the anterior four pairs of parapodia. Acicula of the nereid division in general are notably smaller and less conspicuous than those of the natatory parapodia. The setae of the anterior parapodia are of three types. First, homogomphs, with long, slender, tapering end pieces with fine smooth tips above the marginally setose portion. Second, heterogomphs, much less numerous, which have similar end pieces, but these shorter, and especially so the tips. And third, heterogomphs with shorter end pieces having a short, narrowly rounded tip above the broader portion that is setose along one edge. The shafts are striate as usual. The notopodial setae of the anterior parapodia, of which none at all seem to be present in the first several pairs, are when present, fewer in number than the neuropodials and are shorter and finer. They are homogomphs, otherwise like those of the neuropodium, but with shorter terminal blades. The natatory setae of both neuropodia and notopodia are numerous and of the ordinary type. They are homogomphs with double, striated bands in the shafts, with oar-like terminal blades widening distad and ending in a mucronate apex, and with very fine teeth of uniform character along one side. (Plate 32, fig. 6–8; Plate 33, fig. 5–6).

The proboscis is but slightly protruded. The paragnatha are separate, small, corneus cones of the Nereis type. The maxillae are large, with teeth coarse and distally blunt.

Locality. Marshall Islands: off Rongelab Island. Surface by night light. 17 January, 1900. One male.

This species may be characterized by the form of the prostomium and the position and size of its eyes and palpi; the transversely divided peristomium in which the anterior division is not angularly extended forward; the short tentacular cirri, of which the longest reach only to the fifth somite; the number of somites in the nereid division, seventeen, with specially modified cirri on only the first five pairs, and with no neurocirri strongly modified, only the first two pairs being at all noticeably different; and the small size of the laminae of the natatory setae.

Nereis caenocirrus, sp. nov.[1]

Plate **33**, fig. 7, 8; Plate **34**, fig. 1–6; Plate **35**, fig. 1, 2.

The body in general is colorless, or weakly brownish, probably from preservation, the nereid division in particular being translucent. Eyes black. Tentacles and cirri colorless and translucent. Setae also colorless and transparent.

The larger type-specimen is 16 mm. long with the maximum width, exclusive of parapodia, 1.6 mm., and inclusive of parapodia and setae, 3.4 mm. The body is constricted at the junction of its two principal divisions. The nereid division narrows strongly cephalad and less markedly at its caudal end. The heteronereid division is widest a little in front of its middle from where it narrows slightly forward and gradually and strongly caudad. The number of somites in the nereid division is fifteen and in the heteronereid division fifty-five and sixty, making the total number in the two types seventy and seventy-five respectively.

The prostomium consists of a principal, posterior, ocular division, quadrangular in outline as seen from above, and a low, subtriangular, apically rounded preocular division. Its length is about three fourths the width and is greater than the combined length of the first three somites, but less than that of the first four. The four eyes are of but moderate size and are very nearly equal, the anterior ones being slightly larger. The eyes of each of the two pairs are separated by an equal distance. The eyes on each side are contiguous, with the anterior one cephaloventrad from the posterior. The lens of each posterior eye is directed a little ectad of dorsad. Each anterior eye is more lateral in position, with the length directed cephaloectad. The tentacles are attached beneath the anterior end of the prostomium and project directly ventrad. They are slender, tapered and short, about equalling the length of the proximal article of the palps. The palps are attached on the ventral surface between the anterior eyes, which they exceed in diameter. They are separated mesally and project directly ventrad. The proximal article in each is stout, cylindrical and long, while the distal article is abruptly much narrower, and short and rounded. (Plate **34**, fig. 1).

The peristomium above presents an anterior border of wide, but very low, triangular form. The apical angle very obtuse. The somite is divided by a deep transverse sulcus which is weak laterally but is again strong ventrally.

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[1] *καινὸς* strange, and cirrus.

As a whole it is clearly longer above than the succeeding somites. On each side it widens strongly, projecting forward beneath the eyes, as usual, and ventrally it is longer than the two succeeding somites combined, though shorter than the three. The tentacular cirri are all short, strongly tapered to a point distad, and varicose, or imperfectly jointed, more distinctly so in the distal part. The anterior ventral cirri are shortest. Each is attached in the exterior angle between palp and elevated buccal border and reaches only to the second somite. The anterior dorsal on each side is attached just above the ventral one and at the posterior border of the anterior eye; it extends to the edge of the fifth somite. The posterior ventral tentacular cirrus on each side is attached slightly caudad of and on a level with the anterior dorsal, than which it is a little shorter, reaching to the fourth somite. The posterior dorsal tentacular cirrus on each side is attached between the ventral one and the lower margin of the posterior eye. It is the longest of the four, reaching to the seventh somite. The border of the mouth is elevated excepting on the anterior side and is crossed radially by sulci at moderate distances. (Plate 34, fig. 1).

The metastomial somites of the anterior division are moderately convex above and below. They are simple and entire, though a few of the more anterior ones may show dorsally a weak transverse sulcus over the middle portion. The first of these somites is shortest, the others increasing in length to the fifth, after which they are nearly of uniform length. In the widest part of the division, *e.g.*, near the seventh metastomial ring, the width of each somite is about three and one half times its length. The somites are all distinctly separated. In the posterior division the somites are more depressed. The intersegmental furrows are deeper above than below. The pygidium is short and broad, broadest at middle of length, distad of which it is convex. The anal cirri are moderate in length, slender, and tapered, and varicose.

The parapodia of the anterior or nereid division of the body are biramous and of the usual general character. They increase in length from the first to those in the widest region of the body, those of the last few somites of the division again decreasing. In the most anterior parapodia the neuropodium presents at the distal end a short and conical, distally rounded lobe, or ligula, ventrad of the setae and a short, blunt acicular lobe. Caudad this lobe becomes stouter and blunter. The first five parapodia lack notopodial acicula. Caudad the notopodium relatively to the neuropodium becomes longer and longer, projecting much beyond the latter. On its dorsal side is a stout, subconical lobe which does not extend as far distad as the acicular lobe. In the character of the notocirri the parapodia form two sharply defined groups. In the first, embracing the first seven pairs, the style of the notocirri from a constricted base expands into a conspicuously large body, from the distal end of which extends a very slender tapered process, like a slender beak from a bird's head. In the second group, embracing the eighth to fifteenth pairs, the notocirri are of the ordinary form; slenderly uniformly tapered from the base distad. The notocirri of the most anterior parapodia of the nereid division are attached near the distal end; caudad the point of attachment shifts farther proximad and in the last ones is near the middle of the notopodium. As to the character of the neurocirri there are also two groups. The first of these embraces the first five pairs in which the form is very similar to that of the anterior notocirri, presenting a large expanded middle body, from the distal end of which a very slender, short, oblique distal process extends. On the succeeding parapodia they have the usual slender, distally attenuated form, and decrease somewhat toward the caudal region. The first of this group are broader proximally and somewhat flattened. All neurocirri attached near the base. The natatory parapodia of the heteronereid division present the usual general differences from the others, being as a whole longer, deeper, and much flattened in the anterocaudal direction, and bearing large and conspicuous foliaceous developments. The notopodium bears two of these thin, finely veined, transparent appendages. One on the dorsal side, attached near the notocirrus, is slenderly lanceolate and does not attain the ends of the shafts of the setae. The other is attached on the ventral side, is much larger, and presents the usual auricle proximally on the ventral side of the neuropodium, well proximad of the distal end. It is symmetrically pointed distad and is abruptly narrower just below its middle. From the distal end of the neuropodium arises a very large, subcordate appendage, distally well rounded, with a rather narrow, curved, auricular appendage on the dorsal side at base. The notocirrus bears on the dorsal side of its base a subelliptic foliaceous body attached by one side; the style itself is about equal in length to the cirri; below a slender, transparent, smooth tip there is along the side toward the setae a series of unusually long, well separated and conspicuous enlargements. The neurocirrus presents a short, thick cirrophore, from which rises a style of the ordinary sort and two membranous appendages, a narrowly oblong, weakly sigmoid one on the distal side of the style and, on the proximal side, a much larger one of subdeltoid outline. In the caudal region the same parts are present, but become much smaller. Apparently in the last three pairs the foliaceous appendages are all lacking, the styles of the cirri being long and conspicuous, with the other parts relatively much reduced. (Plate **33**, fig. 8; Plate **34**, fig. 2, 3; Plate **35**, fig. 1, 2).

Two acicula occur in each parapodium excepting those of the first five pairs, in which only the neuropodial is normally developed. The typical acicula of the heteronereid region are slightly curved and distally acute, with the proximal half colorless or nearly so and the distal half abruptly black or reddish black. In parapodia of the anterior region the acicula in general are similar. In addition to the aciculum there is normally present in the notopodium of this region a single stout seta, simple, but with a suture evident in obsolete condition, thicker than the aciculum, which often protrudes freely from the surface and is strongly hooked at the tip, with the distal portion dark in color, the proximal pale; the cross-striated band is single. No notopodial setae other than the uncinate ones are found in either of the types on any of the parapodia of the nereid division, their absence being apparently normal. The neuropodials of all these parapodia are well developed. They are compound heterogomphs of two types. The first type, few in number and occurring on the dorsal side of the fascicle, have the distal piece slenderly tapered and smooth, tip long and fine. The striated band of the shafts is single except distally. In the second and more abundant type the distal piece is much shorter, with the smooth tip short and distally rounded and the setae extending up close to it. The natatory setae are much larger and coarser than the anterior forms. The shaft is strongly cross-striate in the usual double band and terminates in a homogomph socket. The distal piece is paddle-like, clavately widening distad, at the distal end convexly rounded to a minute mucron at the tip; very finely toothed along one side. All are similar in both notopodial and neuropodial fascicles. (Plate **33**, fig. 7; Plate **34**, fig. 4–6).

Proboscis not extruded in either type, though the maxillae extend a little from the mouth. The paragnatha are all conical, acute, and dark in color. They occur in all the areas, but are much more abundant in those of the maxillary half.

Locality. Marshall Islands: off Rongelab Island. Surface by night light. 17 January, 1900. Two males.

This species is strongly characterized by the highly modified notopodial setae of the nereid division, of which but one is present in each notopodium. In these the distal piece is fused with the proximal and is uncinate, the seta as a whole being stouter than the aciculum, dark in color, and conspicuous. Another marked characteristic is in the form of the notocirri of the heteronereid division, these having along one side a series of papillae of unusual length, above which a more slender, smooth tip ordinarily projects at an angle to the main axis.

Nereis pelagica Linné.

Syst. nat., ed. 10, 1758, **1**, p. 654; Blainville, Dict. sci. nat., 1828, **57**, p. 470; Quatrefages, Hist. nat. annelés, 1865, **1**, p. 542; Ehlers, Borstenwürmer, 1868, p. 511, pl. 20, fig. 11–20; McIntosh, British annelids, 1910, **2**, pt. 2, p. 267, pl. 52, fig. 1, 2, pl. 60, fig. 6, 6a, pl. 71, fig. 7, 7i, pl. 80, fig. 25, 25b.
Nereis ferruginea Gunner, Skrift. Kjobenb. selskab., 1770, **10**, p. 169, pl. c, fig. 10.
Nereis verrucosa O. F. Müller, Zool. Danica prodr., 1776, p. 217.
Nereis fimbriata O. F. Müller, *Op. cit.*, 1776, p. 217.
Nereis margaticera Blainville, *Op. cit.*, 1828, **57**, p. 470; Quatrefages, *Op. cit.*, 1865, **1**, p. 510.
Lycoris margaritacea Johnston, Zool. journ., 1829, **4**, p. 420.
Lycoris viridis Johnston, *Op. cit.*, 1829, **4**, p. 419.
Nereis fulgens Dalyell, Pow. creat., 1853, **2**, p. 153, pl. 22, fig. 6–8.
Heteronereis arctica Oersted, Nat. tids., 1842, **4**, p. 117 (epitokous female).
Heteronereis assimilis Oersted, *Op. cit.*, 1842, **4**, p. 117 (epitokous female).
Nereis renalis Johnston, Ann. nat. hist., 1840, **5**, p. 176 (epitokous male).
Heteronereis arctica Oersted, Grönlands Annulata dorsibranchiata, 1843, p. 179, fig. 50, 51, 60, 65, 68, 70 (epitokous male).
?*Nereilepas fusca* Oersted, Annulatorum Danicorum conspectus, 1843, p. 21, fig. 49, 50 (epitokous female).
Nereis grandifolia H. Rathke, Beitr. fauna Norweg., 1843, p. 155, pl. 7, fig. 13, 14 (epitokous male).
Nereis denticulata Stimpson, Invertb. Grand Manan, 1853, p. 33, fig. 23 (epitokous female).
Nereis reynaudi Quatrefages, *Op. cit.*, 1865, **1**, p. 519.
Nereis bowerbanckii Quatrefages, *Op. cit.*, 1865, **1**, p. 541.

Locality. Two specimens in the collection bear simply the label "Albatross, 1886." They doubtless come from the Atlantic North American Coast, and probably off southern New England.

The species is common off both shores of the Atlantic and occurs also in the Pacific. It is found between tide-marks and at moderate depths.

Ceratonereis Kinberg.

Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 170; St. Joseph, Ann. sci. nat., 1897, ser. 5, **8**, p. 285.
Nereis (*Ceratonereis*) Gravier, Nouv. arch. Mus. hist. nat., 1900, ser. 4, **2**, p. 157, 172.

Ceratonereis fakaravae, sp. nov.

Plate **35**, fig. 6–8.

The type-specimen bears eighty-eight pairs of fully developed parapodia in addition to three smaller pairs on a regenerating caudal tip. Length 65 mm.; greatest width between bases of the parapodia (third and fourth somites), 4 mm.; between tips of parapodia at same point, about 5.25 mm.

Prostomium clearly wider than long, in a ratio of about five to four. Preocular portion rectangular, abruptly and considerably narrower than the ocular, which is narrowed forwards and has its anterior margin semicircular, marked above with a median longitudinal furrow, which is rather deep. Posterior eyes at extreme caudal edge of prostomium, the same distance apart as the anterior ones, or very nearly so, transversely subelliptic. Tentacles narrowly conical, separated at base by nearly their basal diameter, nearly equal in length to the first joint of the palpi. Palpi prominent, about four fifths as long as the prostomium, the proximal joint about three fifths as long as the prostomium; apical piece abruptly narrower, roundly subconical.

Peristomium along median dorsal line a little more than three fifths as long as the prostomium; laterally longer than the prostomium. Tentacular cirri short, the posterior dorsals reaching to the fourth metastomial somite; the anterior dorsal reaching upon the first or scarcely to the second, and both ventrals not wholly attaining the first. The immediately succeeding segments are much shorter than the peristomium. The parapodia are short and of nearly the same length throughout. Both notopodial and neuropodial fascicles of setae, excepting in the first two pairs, in which the notopodial setae are lacking. In the parapodia of the first and second pairs, and of the third on one side, the notopodium is a simple conical process which its cirrus about equals in length. The neuropodium is divided into three lobes, a major ventral one of nearly the same size as the notopodium, and two more slender, dorsal ones, the setae arising between the two dorsal lobes, of which the anterior is the more slender, and between the latter and the main or ventral lobe. In the succeeding parapodia the structure of the neuropodium is similar, but the notopodial process becomes trilobed, the more ventral lobes being more slender and all conicocylindrical, distally well rounded. The anterior lobe is the most slender. The setae arise caudad of this anterior lobe and between it and the main lobe. In the first or most anterior parapodia, the parapodial lobes are very nearly equal in length. Caudad the anterior lobe of the notopodium becomes shorter and shorter, and finally practically disappears; at the same time the dorsal and more ventral notopodial lobes become manifestly longer and proportionately more slender, the cirrus upon the former elongating proportionately, and conspicuously exceeding the dorsal ligula. Whereas in the first parapodia the ventral lobe of the parapodium is stouter than the other two, caudad the upper lobes gradually fuse at their bases and then farther distad form essentially a single setigerous lobe much thicker than the ventral one, on which the cirrus becomes short, slender, and inconspicuous.

Acicula stout and black. Setae all compound. The setae of the anterior parapodia are all alike, long and very slender, with the shafts of the usual structure. In the other parapodia the setae of the notopodia continue to be all alike and of the slender type; but in the neuropodium some much stouter setae occur, these having a diameter three times or more that of the more slender ones. Blades of the stouter setae short, socket lateral and oblique, below distal end of shafts. The blades of the ordinary setae moderately long and acuminate, the tips capillary and moderately curved; the blade with a series of short hairs or teeth along the concave side, excepting distally. Socket symmetrically formed in the regularly expanded distal end of the stem. (Plate **35**, fig. 6, 7).

Paragnatha absent from basal region. In I are two paragnatha, one in front of the other. In IV a row of three stout paragnatha, those of III few, those of II uncertain. Maxillae black, cutting edge proximally entire, distally wavy, forming two or three inconspicuous crenulations.

Body anteriorly reddish, becoming in the middle and the caudal region yellowish. Parapodia yellow, the contents of a large basal region of notopodia showing as a black dot in the middle and caudal region. A whitish area on base of prostomium.

LOCALITY. Paumotu Archipelago: Fakarava. Fringing Reef. 12 October, 1899. One specimen.

Characterized especially by its short prostomium, long peristomium, unusually short tentacular cirri, and the two paragnatha in area I.

UNCINEREIS, gen. nov.[1]

Prostomium with broader posterior region and a preocular region narrowing anteriorly. Two pairs of eyes. Tentacles two, attached anteriorly and projecting forwards. Palps large and two jointed, the distal article comparatively large.

Peristomium bowed forward above and ventrally extended caudad into a broad excavation in the second somite. Bearing four pairs of tentacular cirri in which ceratophores are well developed.

Parapodia biramous, each branch bilobed, and the notopodial setae emerging in the interval between the two upper lobes. The lobes of from four to seven pairs of parapodia following the first four pairs, subspherically swollen, all others conically pointed.

Setae of three types, composite setae of homogomph and heterogomph forms, and in addition stout crochets present in most notopodia.

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[1] uncinus, hook, hooked seta, and Nereis.

Proboscis armed with numerous corneous paragnatha arranged in close series (pectinate) as in Platynereis.

GENOTYPE.— *U. subita*, sp. nov.

In addition to the type-species, *Nereis agassizi* Ehlers, and apparently also *N. notomacula* Treadwell and *N. kobiensis* McIntosh fall into this genus, of which the most salient distinctive character is the presence of the hooked setae or crochets in the notopodial fascicles. These are much like those present in lumbrinereids, but are not known to me to occur in other species of Nereis, Platynereis, or related genera. The species of Uncinereis agree closely also in various other characters. All at present known are from the Pacific.

UNCINEREIS SUBITA, sp. nov.[1]

Plate **30**, fig. 1–4.

The general color of the preserved specimens is a dense brown. The tentacles and cirri are much lighter, yellowish.

The type is incomplete caudally. It consists at present of sixty somites and has a length of 22 mm., with a maximum width, exclusive of the parapodia, of 1.8 mm. The body is widest and highest in the region of the fifth somite, from where it narrows and lowers cephalad and, more gradually, caudad in the usual way.

The prostomium is nearly equal in length and breadth. It is widest near the middle at the level of the anterior eyes from where it narrows a little caudad and more strongly cephalad, with the anterior end widely subtruncate, being a little more extended forward at middle than at end, and in outline appearing much like that of *U. kobiensis* (McIntosh). The preocular region is flattened above and depressed below the level of the broader posterior region. The eyes are nearly equal in size. The posterior ones are only slightly nearer together than the anterior and have their axes directed more dorsad. The posterior and anterior eyes on each side are nearly contiguous. The tentacles are not contiguous proximally. They are moderately long, a little exceeding the length of the prostomium, and are slender and gradually acuminate distad as usual. The palpi are nearly as long as the tentacles. The proximal article is about as thick as the width of the prostomium across its anterior end. The distal article is very nearly as long as the proximal one and is about two thirds as thick; it is cylindrical, with the distal end strongly rounded.

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[1] subire, to go under, descend.

The peristomium above is bowed strongly forward over the base of the prostomium. It is clearly shorter above than the prostomium and is, in the median dorsal line, very slightly or not at all longer than the second somite, than which at the sides it is obviously shorter, though ventrally decidedly longer. On the ventral side it curves back as a broad projection into the second somite, the sides of the produced area being concave, and the caudal margin wide and straight. This caudal region is set off by a weak transverse furrow. The ventral area of the prostomium is crossed by numerous fine longitudinal sulci which are toward each side moderately oblique. The anterior margin is straight, curving back slightly on the sides.

The tentacular cirri are inserted as usual. The ventral ones are much more slender and shorter than the dorsal, the anterior ones reaching to the third somite and posterior to the fourth. The ceratophores are short, cylindrical, and a little thicker than the styles at base. The dorsal cirri have ceratophores that greatly exceed those of the ventrals, that of the posterior dorsal also clearly exceeding that of the anterior. The anterior dorsal reaches to the sixth or seventh somite, the posterior dorsal to the twelfth or thirteenth.

The metastomial somites decrease in length to the fifth after which they remain of nearly uniform length. Each of the most anterior ones is bowed conspicuously forwards at the sides. They are highly arched above, though across the top somewhat depressed and with a weak median longitudinal sulcus. They are strongly flattened ventrally, extending but slightly below the level of the parapodia, and have a well-marked neural furrow.

A parapodium from the middle region of the body is short and deep, the dorsoventral diameter or depth exceeding the length. It is flattened in the direction of the axis of the body, as usual. The undivided basal division is much longer dorsally than ventrally, its distal side being oblique and straight. It bears the usual four lobes. The notopodium shows a subcylindrical lobe, narrowing toward the base and subconically distad, which lies below the setae, this rising from a very low conical process of the basal division of the parapodium much shorter than the infrasetal lobe. The infrasetal lobe is longer than the crochets, but shorter than the other setae. The neuropodium projects as a distinct subconical lobe as long as but thicker proximally than the infrasetal notopodial process. At the distal end it presents a short, rounded, presetal and a postsetal lip, which are equal in length, or nearly so. The dorsal lobe presents a thick, obliquely placed base shaped like the frustrum of a cone, from the distal surface of which projects a slender, cylindroconical process proper, which exceeds the other lobe in length, and contiguously with it the notocirrus, which is subfiliform, but tapers gradually distad, and is very long, much exceeding the parapodial lobes in length and, when laid back caudad, extending entirely across the succeeding two somites. The ventral lobe arises at the base of the neuropodial lobe proper, which it slightly exceeds in length and than which it is more slender, being of nearly the same form and size as the infrasetal notopodial lobes. Just proximad of the ventral lobe arises the neurocirrus. This has a small, low, subconical cirrophore and a slender style which reaches to near the tip of the ventral lobe. The neurocirrus remains of uniform proportions throughout, but the notocirrus decreases both in relative and in actual length both toward the anterior and toward the posterior end of the body. The notopodial lobe is stouter in the widest region of the body, that is, on the somites immediately following the fifth, and the ventral and dorsal lobes of the same region are also much stouter. (Plate **30**, fig. 1).

In a typical parapodium of the middle region of the body there are setae of three distinct and well-marked types. In the notopodial fascicle are usually two stout crochets, each of which distally curves first strongly dorsad and then bends ventrad and proximad into a thus somewhat recurving, acute tooth or beak, on the distal curve of which is placed a small, colorless, and transparent rounded tooth or nodule, the main process and distal end of the curved portion of the crochet being dark brown and the remainder of the shaft colorless. A thin transparent process, or keel, extends from the shaft to the tip of the principal tooth. In the notopodium there are in addition compound setae. In these the shafts are finely cross-striate, or camerated, and end in symmetrical sockets. The blades are long and finely tipped, and are finely pectinate below the smooth tip on one side. In the neuropodium, in addition to homogomphs of this type, there are compound setae with unsymmetrical sockets and blades that are short, with small, narrow, and distally rounded tips below which they are finely pectinate on one side in the usual way.

The maxillae have short, acute, only slightly incurved, smooth fangs, below which are six short and mostly blunt teeth. The paragnatha are all corneous and are pectinate, being arranged densely in numerous, transverse rows. Their precise distribution was not satisfactorily determined from the partial dissection, the proboscis being wholly retracted.

Locality. Off E. point Santa Rosa Island, California; Sta. 4571 (lat. 33° 40′ N., long. 119° 35′ W.). Depth 900 fms. 7 October, 1904. One specimen.

A characteristic feature of this species is in the structure of the stout crochets in the notopodial fascicles, which in details is obviously different from that of the crochets of *U. agassizi.* The latter is a larger and proportionately stouter species with a broader head, shorter tentacles, palps having the distal article relatively clearly shorter, and with the notocirri in the middle region much shorter. It is common on the coast of California in the littoral zone down to 60 fms.

PLATYNEREIS Kinberg.

Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 177; ST. JOSEPH, Ann. sci. nat., 1897, ser. 5, **8**, p. 286; GRAVIER, Nouv. arch. Mus. hist. nat., 1901, ser. 4, **3**, p. 155, 197.
Iphinereis MALMGREN, Nordiska hafs. annulater, 1865, p. 181.
Leontis MALMGREN, Annulata Polychaeta, 1867, p. 52.

PLATYNEREIS POLYSCALMA, sp. nov.[1]

Plate **30**, fig. 5–8; Plate **31**, fig. 1–10; Plate **32**, fig. 1, 2.

Epitokous Male (*Heteronereis*).

The general color is dull yellow, with the eyes solid black and the preocular portion of the prostomium colorless and translucent. The cirri also colorless. Under the lens it is seen that in the posterior division there is dorsally a minute spot or short streak of purplish color on the base of each parapodium and also a longitudinal middorsal series of spots of the same color becoming fainter cephalad and not extending into the anterior region, whereas the lateral series may do so; on the ventral surface of the posterior division similar series of purplish dots occur with usually additional markings farther distad on the parapodia and ventral cirri. Setae colorless and transparent.

The largest specimen in the collection is 20 mm. long with a maximum width, exclusive of the parapodia, of 2.1 mm. The body is widest near the middle of its length and narrows to a slenderly acute caudal tip and also decidedly cephalad, the body also appearing more or less constricted at the junction of the nereid and heteronereid divisions. The number of somites in the anterior or nereid division of the body is apparently always fifteen. In the heteronereid division the number may be as high as ninety-five, giving a maximum total number of somites of about one hundred and ten.

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[1] *πολύςκαλμος*, many oared.

The prostomium as a whole is very elongate and is much longer than wide (about in the ratio of seven to four). It presents two sharply defined divisions, a somewhat broader, more opaque, posterior division bearing the eyes, and in front of this a translucent area which is rounded anteriorly, is flattened dorso-ventrally, and on its ventral surface bears the tentacles. The preocular division is scarcely more than two thirds as long as the posterior. Of the four eyes the anterior pair are greatly larger than the posterior; they are nearly wholly ventral in position, and are ventrally but narrowly separated. The lenses are directed ectoventrad. The posterior eyes are dorsal in position, each occupying an extreme ectocaudal corner of the prostomium. They are broadly elliptic in outline as seen from above and the anterior end of each extends a little over the posterior region of the corresponding anterior eye. The tentacles are attached on the ventral surface a little caudad of the ventral border. They are contiguous at base, short and conical in form, and usually extend either ventrad or, more commonly, directly caudad, lying against the prostomium and reaching about half the distance from the point of attachment to the basal division of the prostomium. The palpi are very peculiar. In each the proximal joint is fixed along one side to the ventral surface of the prostomium, its distal end lying a little caudad of the posterior edge of the anterior eyes, from where the joint reaches forward between the eyes, narrowing conspicuously forward and merging with the prostomium before reaching the level of the anterior edge of the eyes. The distal joint extends directly caudad over the border of the mouth. It is conspicuously wider than the proximal joint, is well rounded, and but slightly longer than broad. (Plate 31, fig. 2).

Dorsally the peristomium is produced forward over the prostomium mesally in the form of a conspicuous, usually very acutely tipped, triangular flap beneath which the prostomium is correspondingly depressed. On each side of this the dorsal eye projects back to the second somite over the peristomium. On the ventral side the peristomium is much longer, not fully as long as a ventral eye. The border of the mouth is broad and elevated and is strongly finely radially wrinkled as usual. There are the usual four pairs of tentacular cirri. The ventral cirri of the anterior pair are attached on the ventral surface between the anteroectal border of the mouth and the corresponding eye on each side. Each narrows to a slender acute tip and reaches caudad to the fifth somite. The dorsal cirrus of the anterior pair is attached just ectad of the base of the ventral one and contiguously to it. It is stouter than the ventral one and reaches to the eighth or ninth somite. The ceratophore is short and cylindrical, is usually as thick or nearly as thick as the style at the base of the latter, and is annulate. The style is strongly varicose or irregularly jointed. The ventral cirrus of the posterior pair is attached just caudad and a little dorsad of the base of the anterior dorsal. The style is swollen toward the ceratophore, running out distad to a slender tip and reaching caudad to the fifth to seventh somite. The posterior dorsal tentacular cirri are broken off in all the types, but judging from the basal portions, they must be somewhere near the size of the anterior dorsals. Each is attached just above the corresponding ventral one. (Plate 31, fig. 2).

The setigerous somites are all very short. They are arched but moderately and about equally above and below, the body in general being somewhat lenticular in cross-section with the ventral arch a little flattened. Dorsally the somites are entire and are crossed longitudinally by well-separated striae over the entire arch. Ventrally a longitudinal neural band is set off by furrows, laterad of each of which on each somite of the anterior division there is a transverse sulcus extending toward base of parapodium and thus bisecting the somite, though these sulci are not uniform. There are also some light longitudinal striae. The pygidium is very small, subtrapeziform in outline, with the two cirri small and subconical.

In the nereid division of the body there are two groups of parapodia sharply distinguished by the character of the notocirri, the eighth and succeeding parapodia having notocirri abruptly much smaller and different in shape from those preceding. The notocirrus of the first parapodium has a short, thick cirrophore with the style thick, swollen at base, above which it presents a long, much more slender, angularly bent part which is distally flattened and on one side of the end presents a short angular process. In the second parapodia the style of the notocirrus is distally much broader and the terminal extension is larger. In succeeding parapodia the notocirri increase in length and expand more and more distally, the style being flattened and enlarging clavately distad, the distal expansion presenting from its distocaudal angle an acutely pointed process projecting caudad or ventrocaudad and appearing like the beak of a bird from its head. In the seventh parapodia the notocirri project distinctly beyond the tips of the setae. (Plate 31, fig. 5). On the eighth parapodia the notocirrus is abruptly much shorter, with the style cylindroconical in form and not attaining the ends of the shafts of the setae. (Plate 31, fig. 6). On succeeding parapodia to the end of the nereid division the notocirri decrease progressively in length.

All notocirri are attached toward the distal end of the parapodia. In a somewhat similar way the parapodia of the anterior region are divided into two groups as to the character of their neurocirri, but these two groups do not correspond to those based on differences in notocirri. The first four pairs of parapodia are distinguished from the others in having the neurocirrus large, flattened, and abruptly narrowed to an acute and asymmetrical tip. The neurocirri of succeeding parapodia of the nereid division are of ordinary form, and much more slender, conically acuminate to a finely acute tip. All neurocirri are attached well toward the base of the parapodium, as usual. The anterior parapodia are of the usual biramous and biacicular type. Aside from the low acicular process, the notopodium presents two ligulae which are short and bluntly rounded, the notocirrus being attached at the base of the dorsal one of these. The neuropodium presents a single ligula which is on the ventral side. It is short and stout and bluntly rounded, thicker but not longer than the acicular process. In the heteronereid division of the body the parapodia are longer and are strongly compressed anteroposteriorly and the appendages present the usual foliaceous developments. The notopodium has the two ligulae much enlarged, thin and foliaceous; the dorsal one is slenderly sublanceolate in outline; the ventral one is much larger and extends proximad along the ventral edge of the notopodium into a large auricle. The neuropodium bears distally a very large, transparent, foliaceous appendage which is broadly ovate in outline and extends proximad along both dorsal and ventral side of neuropodium into a rounded auricle, of which the ventral one is smaller and farther distad. The ligula proper of the neuropodium is attached on the ventral edge proximad of the end, extends first ventrad, and then distad at a right angle. The notocirrus presents a style of ordinary form which is strongly varicose along the ventral side and extends beyond the tip of the dorsal ligula; on the dorsal side of its base is a thin, leaf-like expansion which is rounded distally but extends proximad into an acute, auricular lobe. The neurocirrus is attached on the ventral side at the very base. Arising in the middle is the slenderly tapered style of ordinary form; on the distal side of the base arises a peculiar flattened process which projects proximad of attachment into a short process with acutely rounded tip and extends distad into a longer bifurcate appendage; on the proximal side of the style is a large foliaceous appendage extending distad into a distally rounded lobe and proximad into an acutely tipped lobe. In the parapodia of the caudal region the same parts are present, but become much reduced in size and the foliaceous appendages change more or less in shape and disappear wholly in the most caudal region; the shafts of the compound setae become much shorter and in the ultimate pairs only the simple notopodial ridged setae remain; the neuropodium becomes much reduced in the penultimate pair, having only a small transparent aciculum and in the ultimate pair is scarcely at all traceable. The last pair of parapodia are especially modified, being a little longer than the penultimate pair and having the notocirri much thicker and longer, these projecting and looking somewhat like special anal cirri, while the neuropodium is a scarcely obvious rudiment at the base on the ventral side. (Plate 31, fig. 7, 8).

The acicula are two in number excepting in the most anterior parapodia, where there is but a single aciculum in each. The acicula of the anterior region are dark amber colored, those of the posterior region pale yellow or proximally colorless. Notopodial and neuropodial acicula nearly equal in size and identical in form, acutely pointed and straight or, in the posterior region, distally a little curved. The setae are mostly compound, a few in the last pair of parapodia, however, being simple. Those of the nereid division are of both homogomph and heterogomph types. The notopodials are homogomphs with but slightly curved shafts marked by a single, narrow, transversely striate band. The distal piece is long, slenderly acuminate, the naked tip being very fine and usually curved; below this on one side is the usual dense series of short setae. The neuropodials are of three types:— homogomphs like the notopodials; heterogomphs in which the distal piece is much shorter with the short naked tip narrowly rounded and the series of setose teeth short, with the shaft at the distal end presenting a second cross-striate band lacking in the homogomphs; and heterogomphs in which the distal piece is like that of the ordinary homogomph above described. The natatory setae of the parapodia of the posterior division are homogomphs with shafts, as usual, strongly cross-striate and with the longitudinal striate band double. The blades are of the usual general form, being clavately widened distad, narrowed at each end. In the blade of the notopodials there is a weak incurving on one side below the apex; in these the marginal teeth toward the distal end along the incurved region are very long and spine-like and project at right angles to the surface, while proximally these are replaced by the usual very short, fine teeth, the latter sometimes extending distad so as to overlap the longer spines. In the neuropodials the blade is somewhat longer, more abruptly narrowed distad, and the armed margin throughout bears only the fine short teeth. In addition, the most dorsal notopodials represent a third type in which the blades are strongly transversely ridged or ribbed, the ribs in the most dorsal extending nearly to the bases of the blades, while in the more ventral ones the ribs extend less and less toward the base. In the most caudal parapodia, as the ultimate and penult, only the ribbed setae are found; but these appear no longer compound, but rather as simple blades ribbed over most of the expanded portion. (Plate 31, fig. 9).

Dissection shows the paragnatha to be very small and to be closely ranged in lines in areas III and IV. The maxillae are colorless and transparent except distally where tinged with brown. They are well curved in a direction against the flat surface. Each is relatively narrow distally, having a subacute point below which there are, in the single specimen dissected, eight rather large and oblique teeth. (Plate 31, fig. 4).

Epitokous Female.

The general color is dull yellow as in the male. The purple spots on each somite are often united by fine transverse lines of the same color.

The body is moderately convexly arched above and about equally arched below. It is widest near the middle of the anterior division from where it narrows conspicuously forwards. The posterior half of the posterior division narrows strongly caudad to an acute angle. The total length of the maximum specimen is near 27 mm., with a maximum width, exclusive of parapodia, of 3 mm. In the anterior division there are typically twenty-three setigerous somites and in the posterior division from sixty to seventy, which, with the peristomium, gives a total of from eighty-four to ninety.

The main part of the prostomium, occupied by the eyes, is quadrangular, the region in front of the eyes being in outline in the form of a low triangle, with the apex broadly rounded and much shorter than in the male. This apical region is more transparent, as in the male, and is similarly flattened dorsoventrally. On the ventral surface of this anterior portion are borne the two tentacles. These are conically tapered from the base, where they are contiguous, to an acute point. When extended directly caudad, as seems to be usual in the preserved specimens, they reach beyond the anterior border of the mouth and nearly to the tips of the palpi, being actually and relatively much larger than in the male. The palpi are attached on the ventral surface in front of the mouth and between the positions of the anterior eyes. The distal article of each is short and rounded, but little longer than thick. The proximal article is much thicker. The four eyes are large, though the posteriors are decidedly smaller than in the male. On each side the posterior eye is directly caudad of the anterior one and nearly contiguous with it. The anterior eye is much larger than the posterior. The prostomium is dorsally mesally notched behind, a triangular flap from the peristomium extending into or above the notch as in the male. (Plate 31, fig. 1).

The peristomium is very short as compared with the prostomium, but dorsally is clearly longer than the second somite. It is divided on each side above by a transverse furrow which, toward the middle, extends forward along the side of a triangular area into the before mentioned notch of the prostomium. The tentacular cirri are strongly varicose or irregularly jointed, the joints being very short. The dorsal tentacular cirri of the first pair are long; each is attached immediately below the interval between the two eyes; the ceratophore very short; the style gently tapered and reaching to the tenth or eleventh somite. Each anterior ventral tentacular cirrus is attached below at the lateral border of the mouth; it is subulate and reaches to the fifth somite. Each ventral tentacular cirrus of the posterior pair is attached at nearly the same level as the dorsal of the anterior pair; it is more slenderly tapered and reaches to the eighth somite. Above it is attached the dorsal cirrus, but this in all the types is broken off near the base at which it is as thick as or a little thicker than the dorsal anterior one. The border of the mouth laterally and posteriorly is broadly elevated and is strongly radially wrinkled.

The anterior setigerous somites are very short. Above, each is divided by a transverse sulcus, while one or more weaker sulci may occur caudad of this. On each side just above the parapodium each somite is crossed by a conspicuous series of longitudinal striae, these becoming weaker over the middle region of the dorsum. Ventrally there is a similar dividing transverse sulcus on each somite, this much more deeply impressed in the neural furrow and with faint secondary sulci on each side showing especially laterally. The pygidium as in the male; no anal cirri present in the types.

Parapodia in general structure as in the male, but modified very differently in the anterior region. In this region the neurocirri are attached on the ventral side near the base; on the first parapodia they are relatively and actually thicker and longer than on the others, not flattened; decreasing gradually caudad until they are very slender and fall much short of attaining the end of the neuropodium, whereas in the anterior ones they equal that ramus. The notocirri of the most anterior parapodia are stout and conspicuously long, extending much beyond the notopodium; each narrows rather abruptly distally into a slenderly cylindrical, distally pointed tip. Caudad the notocirri become smaller, as a whole subulate, with no abrupt contrast between proximal and distal halves. The most anterior parapodia are very short in comparison with their height. They increase in length and stoutness caudad, those in the posterior portion of the anterior division being unusually thick and distended with ova. The neuropodium has one distinct ligula, the notopodium two. These in the first few pairs are slender, but soon become thick and blunt. In the heteronereis division the parapodia are longer and much thinner and flatter in the cephalo-caudal direction, with the ova extending into them not at all or only an occasional one or two in the extreme base. Aside from the transformation of the setae into the larger paddle-formed swimming type, these parapodia are conspicuously different in their thin, membranous or foliaceous appendages, which in general are like those of the male.

The acicula and setae are essentially as in the female. The tips of the longer anterior setae seem to be, as a rule, less prolonged. (Plate **30**, fig. 5–8; Plate **31**, fig. 10).

The maxillae are larger and broader than in the male. Each is curved ventrad as well as mesad. Distally comparatively wide and blunt. The mesal edge armed with seven to ten low obtuse teeth, which at the distal end of the series may appear as but slight undulations of the edge. (Plate **31**, fig. 3).

LOCALITIES. Ellice Island: Funafuti. Surface of lagoon, at 8 P. M. 24 December, 1899. Five females and thirty males.

GILBERT Islands: off Arhno reef. Surface by night light. 21, 24 January, 1900. One male on the former date, and five males and one female on the latter.

While the two sexes of this species are very similar in general color, in the fine purplish markings, and in general appearance, as well as in the structure of the setae and the armature of the proboscis, they present very striking secondary differences in various other structural details. The prostomia are alike in having the characteristic transparent preocular lobe; but in the male it is greatly longer, with the tentacles very much shorter and the palpi conspicuously modified. The differences in the number of somites in the nereid division and in the structure of the parapodia, particularly of the cirri, are marked. The structure of the natatory setae, as well as of the simple notopodials, and the form of the prostomium and its structures seem to be especially characteristic in this species.

PERINEREIS Kinberg.

Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 175; ST. JOSEPH, Ann. sci. nat., 1897, ser. 5, **8**, p. 285; GRAVIER, Nouv. arch. Mus. hist. nat., 1901, ser. 4, **3**, p. 155.
Lipephile MALMGREN, Annulata Polychaeta, 1867, p. 50.
Stratonice MALMGREN, *Op. cit.*, 1867, p. 56.
Hedyle MALMGREN, *Op. cit.*, 1867, p. 58 (epitokous form).

PERINEREIS HELLERI Grube.

Plate **35**, fig. 8.

Nereis (*Perinereis*) *helleri* GRUBE, Annulata Semperiana, 1878, p. 81.

This species has a close resemblance to *P. cultrifera* Grube occurring on the coasts of Europe. The specimens represented in the present collection agree essentially with Grube's description of the type of *helleri*, which is from the Philippines, as far as it goes.

The teeth of the maxillae are distally blunt or subacute, clearly less acute than in *cultrifera*. The paragnatha in group V are three in number, conical, arranged in a triangle. There is a single, lamelliform transverse tooth in VI. In I are two small conical teeth, one behind the other. In II there is a group of small conical teeth, few in number (seven to ten). In III there is a transverse patch of about ten teeth, usually in three transverse rows, with on each side of this patch and at some distance from it a characteristic group of two teeth one behind the other. In IV there are fourteen or more teeth in a triangular patch, with at its anterior apex often two teeth considerably smaller than the others.

The anterior eyes are decidedly farther apart than the posterior ones, in this not agreeing with Grube's statement as to *helleri*.

LOCALITIES. Paumotu Islands: Makemo. Reef flat. 20 October, 1899. Anterior ends of two specimens.

Easter Island. Shore. 20 December, 1904. Several specimens.

PSEUDONEREIS Kinberg.

Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 174.
Paranereis KINBERG, *Op. cit.*, 1865, p. 175.
Naumachius KINBERG, *Op. cit.*, 1865, p. 176.

Pseudonereis atopodon, sp. nov.[1]

Plate **35**, fig. 3–5.

Consisting of from eighty-eight to one hundred and five parapodia-bearing somites. Length of type 85 mm. Greatest width, which is in the region of the fifth somite, 3 mm., exclusive of the parapodia. One paratype has a width of 4 mm. in this same region. Back of the region of greatest width the body rapidly narrows and the dorsum becomes correspondingly lower.

Prostomium as long as greatest width across base, or very nearly so. Preocular portion bulging laterad at base, where as wide or slightly wider than width across anterior eyes; anteriorly widely and evenly semicircularly rounded. Posterior eyes at caudal edge as usual; large and somewhat obliquely subelliptic. Anterior eyes a little farther apart than the posterior. Tentacles rather stout at base, conical, distally slender; nearly contiguous at base; fully four fifths or more as long as the prostomium and extending much beyond tips of the palpi. Palpi relatively very thick but proportionately short; distal article abruptly narrower than the first, but still relatively broad, distally subtruncate.

Peristomium along median dorsal line but little more than half as long as the prostomium; laterally four fifths as long. Tentacular cirri short. Posterior dorsals reaching to the fifth parapodia-bearing somite; anterior dorsals reaching the second; ventrals a little shorter than the anterior dorsals, subequal to each other.

Parapodia all of moderate length. Both notopodial and neuropodial setae occurring in all parapodia, excepting those of the first two pairs. In the notopodia of the first two somites there is a single distally rounded lobe, from the dorsal side of which arises a cirrus greatly exceeding it in length. In the caudal region the dorsal lobe is more elongate and the cirrus arises almost directly from its end, which appears as a slight rounded eminence at one side of the base of the long and slenderly acuminate cirrus. In the second and succeeding segments a second notopodial lobe is present between which and the cirriferous lobe the setae arise. In the neuropodia throughout there are two lobes, a ventral one bearing a cirrus much shorter than the dorsal one, in the anterior region a little exceeding its lobe, but as usual becoming shorter caudad and a second stouter setigerous lobe, the distal end of which may appear weakly bilobed. (Plate **35**, fig. 3).

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[1] ἄτοπος, strange, and ὀδών, tooth.

The setae of the notopodia are all of the ordinary slender type. In all neuropodia there are in addition much stouter setae, with shorter blades. In the setae of the stouter type the shaft is weakly curved; the socket is very oblique; the blade is small, conspicuously concave on the side on which the higher edge of the socket occurs, in the ordinary setae the sockets are homogomphous; the blade is long and distally capillary. (Plate **35**, fig. 4, 5).

Paragnatha well developed on both basal and maxillary rings. V with a single transversely elongate tooth or lamella; VI with a larger transverse lamella which is more or less divided into two parts; VII and VIII with teeth in a double transverse row, these teeth conical and somewhat flattened. The teeth in IV are in five or six closely ordered transverse rows, and are cognate at base in each series (pectinate). The teeth are similarly pectinate in four series in II. Teeth of I and III uncertain.

The body in general is a somewhat dilute and nearly uniform brownish. The tips of the parapodial lobes and the cirri are paler.

LOCALITY. Tonga Islands: Nomuka. Taken on beach rock. 2 December, 1899. Four specimens.

Especially distinctive of this species is the presence on the proboscis in I of a distinctly lamelliform transverse tooth, or plate, together with the numerous seriate or pectinate teeth in II and III. It has resemblances to *P. galapagensis* (Kinberg).

LEODICIDAE.

In this large family the body is long and more or less cylindrical, and is composed of numerous, essentially similar, short somites. The integument is smooth and commonly iridescent.

The prostomium is distinct. It bears a pair of palpi. The number of tentacles varies from one to five, but frontal tentacles are never present. They are either subulate or may be very elongate distad of the basal region; a ceratophore often distinct, and the style may be smooth or more or less annulated. Eyes two or none. Nuchal organs in the form of ciliated grooves.

The peristomium is biannulate and may or may not bear a pair of nuchal tentacular cirri upon the second annulus.

The parapodia are uniramous. Each bears a dorsal and a ventral cirrus.

A certain number of the notocirri may bear branchiae. The branchiae may be simple filaments or more or less highly branched. Sometimes they are rudimentary and may be wholly absent.

Normally both simple and compound setae are present. The simple setae are of various types, a characteristic form among the ordinary ones being a very delicate type with fine stalk and expanded terminal part distally pectinate. The compound setae have the terminal piece hooked or dentate, with membranous shields over the teeth. In the middle and posterior region uncinate spines or crochets occur.

Anal cirri two or four.

The nephridia have large, open, internal funnels through which in ordinary forms the sex products find exit.

The proboscis is always armed with a powerful and complex system of horny or partly calcareous plates or jaws. Of these there is ventrally a pair of mandibles and in addition seven or nine maxillae, the odd plate being normally on the left side.

A distinct sexual dimorphism exists in some species, such as *Leodice norvegica* and *L. gigantea.* A form of epitoky also occurs in some species, among which are the more conspicuous representatives of the PALOLO worms about which so much has been written, the best known of these being the *Leodice viridis* (Grube) of the South Seas. Typical epitoky, as seen for example in the Nereidae and Syllidae, is accompanied by a transformation in the parapodia and the development of special natatory setae in the sexual or epitokous division of the body. In the members of the present family these modifications do not occur. On the contrary, in the epitokous region the setae become much reduced in number and the somites undergo other special changes. At the time of sexual maturity the epitokous region becomes detached from the anterior end and, leaving the normal habitat, such as the cavities or burrows in coral reefs, rises to the surface and becomes pelagic. At the surface the sexual products are discharged. This swarming occurs at very definite times in relation to season and the phases of the moon. The habits of the ATLANTIC PALOLO, *Leodice fucata,* have been described by Mayer (Papers Tortugas lab., 1908, **1**, p. 107, pl. 1). *Cf.* also Moore's observations on *L. paloloides* of the Californian Coast (Proc. Acad. nat. sci. Philad., 1909, p. 246). At the time of swarming the ATLANTIC PALOLO turns about in its tunnels in the coral and limestone, detaches the sexual division, from which the products are discharged at the surface at sunrise, while the head-end regenerates the posterior end. In the same category is the "WAWO", as known to the natives of the Malay archipelago, which is *Lysidice oele,* this form swarming on the second and third nights after full moon in March and April. (*Cf.* Horst, Mus. Haarlem Rumphius gedenkb. kolon., 1902, p. 105).

Most of the leodicids secrete tubes of varied consistence, many of these being hyaline or papyraceous and composed exclusively of the secretion of the worm, while in other cases fragments of shells, frustules of diatoms, shells of Foraminifera and Radiolaria, tubules of serpulids, fragments of sea-weeds, and other materials may be made use of in the construction of the walls. The tubes are commonly simple, but may be branched. The mucus forming the substance or the matrix of the tubes is secreted by glands at the bases of the neurocirri of the anterior region. Some species inhabit cavities or burrows in rocks, calcareous Algae, coral reefs, or in the mud, the retreats being lined ordinarily with a thin layer of transparent material.

They are frequent in all parts of the world, though apparently more abundant in the warmer seas. They occur often between tide-marks or near low tide, in crevices of rocks, in mud, as among the growths of Zostera, among shells, or in madrepores. In removing them from their retreats autotomy is frequent. On the other hand some species may occur at depths approaching the thousand fathom mark, though they do not attain depths as great as in the closely related forms of the Onuphididae.

Many species exhibit phosphorescence. Thus Crossland found *Lysidice afra* (Peters) to be strongly phosphorescent during removal from the mud, a blue light being given out from the mucus secreting pads adjacent to the neuropodia and the mucus itself remaining luminous.

Key to Genera.

a. Branchiae present.
- *b.* Tentacles and eyes none .... *Iphitime* Marenzeller.
- *bb.* Tentacles and eyes present or the latter indistinguishable.
  - *c.* Tentacles five.
    - *d.* Tentacular cirri present .... *Leodice* Savigny.
    - *dd.* No tentacular cirri.
      - *e.* Composite setae present .... *Marphysa* Quatrefages.
      - *ee.* Setae all simple .... *Aphelothrix*, gen. nov.[1]
  - *cc.* Tentacles three or less; tentacular cirri none.
    - *d.* Tentacles three .... *Amphiron* Kinberg.
    - *dd.* Tentacles two .... *Coelobranchus* Izuka.

aa. Branchiae none.
- *b.* Tentacles five.
  - *c.* Tentacular cirri present .... *Nicidion* Kinberg.
  - *cc.* No tentacular cirri .... *Paramarphysa* Ehlers.
- *bb.* Tentacles three or less; no tentacular cirri.
  - *c.* Tentacles three .... *Lysidice* Savigny.
  - *cc.* Tentacle one .... *Nematonereis* Schmarda.

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[1] *Marphysa mossambica* Peters, genotype. ἀφελής, simple, and θρίξ, bristle.

Synonymy of Genera.

Nauphanta, and Nausica Kinberg (1865) fall under Marphysa as does also MacDuffia McIntosh.

Blainvillea Quatrefages is synonymous with Nematonereis Schmarda.

The position of Heteromarphysa Verrill is somewhat doubtful. It would fall with Nicidion in the key above, but according to Verrill's account differs from that genus in having the prostomium fused with the peristomium above and also with the second somite.

LEODICE Savigny.

Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 13, 48.
Eunice CUVIER, Règne anim., 1817, **2**, p. 525; ed. 3, 1830, **3**, p. 199; QUATREFAGES, Hist. nat. annelés, 1865, **1**, p. 307; EHLERS, Borstenwürmer, 1868, p. 303.
Nereidonta BLAINVILLE, Dict. sci. nat., 1828, **57**, p. 475.
Eriphyle KINBERG, Öfvers. K. vet. akad. Forh., 1865, no. 4, p. 561.
Mayeria VERRILL, Trans. Conn. acad. sci., 1900, **10**, p. 650.

The species of Leodice listed in this paper may be separated as follows:

- *a.* All branchiae simple, cirriform.
  - *b.* Tentacles strongly articulated, nearly moniliform; branchiae beginning on somite IX; teeth of maxillae II six or seven.......................................*L. makemoana*, sp. nov.
  - *bb.* Tentacles not obviously articulated; branchiae beginning in middle region of body; teeth of maxillae II two (or three).......................................*L. siciliensis* Grube.
- *aa.* Branchiae, in part at least, branched.
  - *b.* Tentacles smooth throughout, not distinctly articulated.
    - *c.* First branchiae occurring on somite V, the last on or near somite XLIII...*L. segregata*, sp. nov.
    - *cc.* First branchiae on somite IX or farther caudad.
      - *d.* First branchiae on somite XVII or XVIII, the last on or near somite CXII....*L. lita*, sp. nov.
      - *dd.* First branchiae on somite IX, and occurring on all subsequent ones excepting last two or three.......................................*L. contingens*, sp. nov.
  - *bb.* Tentacles distinctly annulate.
    - *c.* Branchiae beginning on somite VII.
      - *d.* Branchiae at most with two or three branches, these rather arbuscular, but mostly simple and cirriform.
        - *e.* Branchiae all shorter than the notocirri; branched branchiae beginning with the fourth. *L. oliga papeetensis*, subsp. nov.
        - *ee.* Branchiae in widest part of body decidedly longer than the notocirri; branched branchiae beginning with the second.......................................*L. oliga*, sp. nov.
      - *dd.* Branchiae in part with five to seven filaments and most with more than three, the branchiae unilaterally pectinate.......................................*L. panamena*, sp. nov.
    - *cc.* Branchiae beginning on somite IX or X.
      - *d.* Branchiae beginning on somite X; filaments arbuscular in arrangement, at most four in number; tentacles articulate only distally..................*L. pauroneurata*, sp. nov.
      - *dd.* Branchiae beginning on somite IX; unilaterally pectinate, with filaments numerous, exceeding ten on some branchiae; tentacles articulate proximally..........*L. nesiotes*, sp. nov.

LEODICE MAKEMOANA, sp. nov.

Plate 53, fig. 1–11.

The type is greyish yellow throughout, the only markings being a longitudinal series of small, transversely elongate, whitish spots over the middle region of the dorsum, a single spot occurring on each somite, and a midventral white stripe. The appendages are but slightly paler than the body. From the region of the seventeenth and adjacent somites the body narrows conspicuously cephalad but only slightly caudad, remaining of nearly uniform width to the extreme caudal region where it narrows strongly to the pygidium.

The total length of the type is only 20 mm. The greatest width, exclusive of parapodia, is 1.8 mm. The total number of somites is ninety-four.

The prostomium appears a little shorter than the peristomium. It is bilobed as usual, a wide, rounded furrow extending down its anterior face. Each lobe curves outward and caudad and is but weakly subdivided by a cross-furrow. Its surface is very smooth. The tentacles are arranged in a transverse row contiguous with the margin of the peristomium excepting the outer paired ones which are inserted at the side farther forward. The tentacles are all distinctly jointed and almost moniliform, the articles being very short and rounded. The median tentacle, the tip of which is apparently broken off at point, consists of sixteen articles and reaches the seventh somite. Each inner paired tentacle consists of fourteen articles, or close to that number, and reaches the fourth somite. Each outer paired tentacle is constricted toward base, and is very short, consisting of six (or seven) articles and not quite reaching the second somite. The eyes are black, broadly elliptic areas, caudad of each outer tentacle, and partly covered by the peristomium. (Plate 53, fig. 1).

The peristomium dorsally is shorter than the three succeeding somites, and the anterior margin is a little incurved mesally opposite the median tentacle and the surface is wholly smooth. Laterally there is on each side a sublongitudinal furrow extending from an incision in the anterior margin, the surface above the furrow crossed by a few subvertical wrinkles; from the anterior end of the furrow a weaker furrow extends caudomesad, setting off the lower lip. The surface of the lower lip is smooth. Its anterior margin at the middle curves deeply and semicircularly caudad.

The second somite is distinct above and below, but at the sides is fused with the first somite. It is shorter than the third somite. The cirri are very small, pale, distally tapered processes extending but little beyond the middle of the peristomium. They seem but vaguely and partially annulate. (Plate 53, fig. 1).

The third and succeeding or parapodia-bearing somites are regular and undivided. They are rather short, in the widest part of the body being eight times wider than long. The dorsum is strongly convexly arched in the usual way, a little depressed along the middorsal line and along each side toward the parapodia. The anterior somites show a few weak longitudinal impressed lines. The venter is flat; a weak vertical furrow is traceable except anteriorly and posteriorly, the furrow more distinct over middle and caudal portions. The pygidium is very short, slightly narrowed caudad and broadly obliquely truncate, the anus being subdorsal in position. There are two anal cirri scarcely exceeding a mm. in length, pale, gradually tapered and annulate, the annuli short and not strongly marked; and in addition there are two more ventral cirri, these being relatively minute and also indistinctly shortly annulate, one inserted at base of each larger one on its ventral side.

The parapodia are processes of moderate length, distally more or less rounded, and having a slightly elliptical cross-section, the long diameter being vertical, so that the parapodia appear somewhat compressed in an anterocaudal direction, the most anterior ones, however, being more strictly cylindrical, all narrowing distad. The first parapodium on each side is noticeably reduced. The dorsal cirri arise from the bases of the parapodia. Each is a moderately slender process thickest at base and gradually tapering to the narrowly rounded distal end; it is annulate, the annuli being very short and usually not strongly marked, or sometimes even vague. In the anterior region the notocirri decidedly exceed the parapodia and setae; caudad they become more slender and shorter. The ventral cirri in the anterior region consist of a cylindrical, proximal article and a much shorter, abruptly narrower, distal article which is a little narrowed distad and has the distal end rounded. The neurocirri of the region a little exceed the parapodia. In the posterior region the neurocirri are, as a whole, much less stout, conical processes, and toward the caudal end have become markedly slender, with the apical portion long, thin, and uniform in diameter, subfilamentous. In all parts the neurocirri remain longer than the parapodia.

The branchiae begin on the ninth somite (seventh parapodial) and occur on all subsequent somites excepting the last six. The branchiae consist in all cases of a single, slender, wholly unbranched filament. The filament is slightly tapered from the base to a narrowly rounded extremity. The first branchia exceeds its notocirrus only a little, but the following ones rapidly increase in length and soon greatly exceed the cirri, in the widest region of the body falling but little short of attaining the middorsal line. From this region caudad they again rapidly decrease in length, but they remain of nearly uniform length in the middle and posterior region where they extend but about half way to the middorsal line. The branchiae of the last three pairs rapidly decrease, the last ones being but slight rudiments. (Plate 53, fig. 7–11).

The acicula proper are two in number in each parapodium, the tips visibly projecting on parapodia from the second inclusive caudad. They are pale in color, the posterior ones scarcely darker than the first ones. The hind portion of each is straight, slightly narrowing distad; the short projecting tip is slightly curved, and subventrally directed. The crochets first appear on or near the twenty eighth parapodia, projecting a shorter distance in anterior part of series than in the posterior. Each crochet is in the distal half curved first greatly cephalad and then a little caudad. The head may bear either two teeth, or a reduced, supplementary, third tooth is more frequently present on caudal side of the apical one. The apical tooth is a little curved forwards, the small one at its base being vertical. The supplementary tooth is much stouter and longer and stands either nearly at right angles to the axis or, in posterior region, it is more commonly considerably reflexed proximad. The guards extend out over the subapical tooth and rise to a little above the level of the apical one. (Plate 53, fig. 6). The compound setae form a ventral group of usually three or four. The shafts of these are long, gently curved, with the convexity cephalad, of uniform diameter to near the distal end where clavately enlarged, the enlarged portion unusually short. The appendage is a small narrow piece ending above in a long, curved, terminal tooth; below this is a very small, subapical tooth; below the subapical tooth the piece widens to an obtuse process, with upper edge horizontal for a short distance from apex, leaving a very small tooth. The guard is narrow, its free edge weakly concave. (Plate 53, fig. 5). The capillary setae of the dorsal fascia much exceed the other setae in length; they are distally slenderly acuminate, being drawn out to a very fine tip; they are usually distally curved. The pectinate setae have the usual general structure. The distal piece is proportionately broader and shorter than the average. The teeth increase in length from one edge to the other, at which there is a much longer process. (Plate 53, fig. 4).

The maxillae are pale and small. Maxillae I have the united carriers forming a plate somewhat shield-shaped; the caudal end rounded and mostly shallowly incurved, the sides convex caudally, concave toward anterior end, with the greatest width across anterior end; anterior margin forming a very obtuse reentrant angle; plate black along anterior margin and down the median line. The blade is of the usual general shape. (Plate **53**, fig. 3). Maxillae II with six large teeth on the left piece, seven on the right. Maxillae III with the right piece strongly, almost semicircularly, bent; bearing eleven (or twelve?) smaller teeth; the left paired piece less strongly curved, with eight teeth, the unpaired piece also apparently with eight somewhat smaller and paler teeth. The mandibles are nearly uniform whitish throughout. The anterior margin of the masticatory plate is little, very obtusely angularly, incurved, but not dentate; the outer edge is a little incised. The surface of the plates is finely striate, the stems are broadly united anteriorly. They are straight, each broad at the anterior end and narrowing conspicuously caudad. (Plate **53**, fig. 2).

Locality. Paumotu Islands: Makemo. 21 October, 1899.

One specimen.

While there might seem the possibility that this may be the young of a previously described species, this is very improbable in view of the highly distinctive combination of characters it presents, and especially of the fact that the specimen contains well-developed eggs. The presence of branchiae as wholly simple filaments on all but the first six and last six pairs of parapodia, the strongly jointed, submoniliform tentacles, the extremely short tentacular cirri, the annulate notocirri, and anal cirri, the essentially tridentate crochets, and the form and dentition of the mouth-parts would seem clearly to establish this specimen as the type of a very distinct species.

Leodice siciliensis (Grube).

Eunice siciliensis Grube, Actin. echinod. würmer Mittelmeeres, 1840, p. 83; Archiv. naturg., 1851, **17**, p. 41; Ehlers, Borstenwürmer, 1864, p. 353, pl. 16, fig. 1–7; Grube, Annulata Semperiana, 1878, p. 161; Gravier, Nouv. arch. Mus. hist. nat., 1900, ser. 4, **2**, p. 261; Crossland, Marine fauna Zanzib. & Brit. E. Africa. Polychaeta, 1903, **3**, p. 323, pl. 22, fig. 8, 9; Augener, Fauna Südw.-Austr. Polych., **1**, 1913, **4**, p. 279.

Eunice adriatica Schmarda, Neue wirbellose thiere, 1861, **1**, pt. 2, p. 124, pl. 32, f. 257.

Eunice taenia Claparède, Mem. Soc. phys. hist. nat. Genève, 1864, **17**, p. 120, pl. 4, fig. 11; Annélides Chétop. Golfe Naples, 1868, p. 135.

Eunice ebranchiata Quatrefages, Hist. nat. annelés, 1865, **1**, p. 316.

Eunice bitorquata Grube, Jahresb. Schlesch. gesellsch., 1869, **49**, p. 28.

Eunice leucodon Ehlers, Zool. jahrb. Suppl., 1901, **2**, p. 261; Festsch. K. gesellsch. Göttingen, 1901, p. 128, pl. 16, fig. 1–10.

A single, unusually long specimen broken into two pieces is in the collection. The body in general is greyish brown, in some parts of a more or less rusty tinge.

The total length is near 330 mm. with a maximum width of 3.5 mm. The total number of somites is in the neighborhood of seven hundred. The first branchia detected was near somite CCCXV. The mandibles project prominently as usual; each is white along the ectal border and in a narrowing stripe along the anterior edge, being elsewhere dilute brown. The maxillae are black, not edged with white as in *leucodon* Ehlers, with the teeth typical. The antennae are of moderate length but decidedly longer than represented by Ehlers for his *leucodon,* the types of which were taken at Juan Fernandez. The structure of the setae seems to be typical.

This species, which is very closely allied to the famous PALOLO worm (*L. viridis*), has an exceptionally wide distribution, having been previously recorded from the Mediterranean, Madeira Island, West Indies (Porto Rico), Juan Fernandez Island, Philippines, Australia, East Africa, Gulf of Persia, and Red Sea.

LOCALITY. Off Panama: Taboguilla Island. 31 October, 1904.

One specimen taken on the shore.

LEODICE SEGREGATA, sp. nov.[1]

Plate **54**, fig. 1–5.

Type incomplete; about 114 mm. long; maximum width of body, 7.1 mm. Number of segments in the incomplete specimen one hundred and eighteen.

Prostomium broad, deeply sunken in peristomial collar to bases of tentacles, anteriorly deeply incised and bilobed to form the thick, bluntly rounded palpi. Each palp divided by a shallow transverse groove into a more prominent ventral and a smaller dorsal lobe. Tentacles in a transverse row in which the two laterals on each side are close together but not contiguous, the median separated from the nearest lateral on each side by a wider space. Tentacles smooth throughout, not at all annulated or articulated and with no distinct ceratophore. Median tentacle reaching to somite VII; outer paired tentacles much stouter, reaching only somite II.

Peristomium large, equalling in length the two and one half succeeding somites; on each side weakly longitudinally furrowed, below the furrow the prominent, thickened lower lip which is crossed longitudinally by a number of impressed lines or sulci, but the free edge of lip not crenulated, mesally straight.

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[1] *segregare,* to separate.

Somite II apodous as usual, coalesced with I at the sides. Nuchal cirri more slender than tentacles, like which they are smooth, subulate, reaching to near middle of prostomium.

The succeeding somites bearing parapodia, regular, undivided; at widest part of body about seven to eight times as wide as long, posteriorly only four to five times wider than long. Strongly arched above, ventrally slightly arched, with deep median longitudinal neural groove. The greatest width is attained in the region of somite XXV, from whence the body width is nearly uniform to near somite XL, following which it gradually decreases.

Parapodia simple rounded processes of the form and arrangement usual in the genus. Notocirri conspicuous, proximally stout, distally strongly tapered, subulate; posteriorly more slender, as usual. Neurocirri anteriorly with large, conspicuously swollen, bases of elliptic outline on each of which is borne a very short, abruptly greatly thinner style; posteriorly the base is less swollen and finally passes gradually into the style, the whole cirrus being somewhat subconical; short, but little exceeding the parapodium.

Branchiae beginning on somite V, on which each branchia is a simple slender filament. The branchia of somite VI has a single branch; on somite VII the branches are abruptly more numerous, reaching ten; on subsequent somites the branchiae acquire branches increasing in number and length; the stem typically stout, distally acuminate, pigmented and presenting an annulated appearance, arising from base of notocirrus; filaments unilateral in arrangement, or occasionally with one small branch inserted on opposite side distally, on branchia of twenty eighth somite, near twenty-one in number. The filaments decrease again in number caudad, the last branchiae, which occur on somite XLIII, having but two filaments each. The branchiae are long, much exceeding the middle of dorsum excepting at ends of branchiate region, the dense tufts of filaments largely concealing the dorsum. In a paratype from Sta. 3417 the first branchiae, *i.e.*, those of somite V, have numerous branches, but on posterior somites the number gradually decreases. In paratypes branchiae may occur as far back as the sixtieth somite. (Plate **54**, fig. 4, 5).

The acicula are yellow with the central fibrillae darker. They are stout, distally acuminate and slightly curved distally; medulla conspicuously fibrillate; they are mostly two in number. Anteriorly they scarcely protrude from the tubercle, but on the posterior segments they protrude conspicuously. The setae are nearly colorless, being of a weak yellowish tinge. They are of the usual four kinds. A dorsal tuft arising in connection with the acicula is composed of rather numerous, slender, colorless, simple capillary setae. These appear flattened, distally slenderly pointed, and straight or slightly curved. Among the capillary setae are the shorter delicate pectinate setae; each of these presents the usual clavately expanded distal end which is finely toothed along its free edge and at one angle bears the usual marginal process which may be conspicuously curved outward, but is often straight. (Plate **54**, fig. 2). Below these are the compound setae; these are stouter than the capillary setae; they are pale yellow in color; each is composed of a shaft, which is straight or nearly so, and is moderately enlarged distad, and of a bidentate appendage covered as usual by a delicate guard. On the middle and posterior segments crochets appear; these are stout, distally narrowed and moderately curved; the principal tooth of each is very stout and at its tip is slightly curved toward axis; the usual terminal tooth is slightly curved toward the other tooth; its tip is about on a level with that of the principal one. (Plate **54**, fig. 3).

Masticatory plates of mandibles hard, white, their anterior edge wavy and the ectal angle acutely produced; stems of mandibles blackish, stout, straight, and a little divergent; the halves firmly united anteriorly by an isthmus. Maxillae I (forceps-jaws) with basal pieces, or carriers, longer than wide; each with outer edge nearly straight and subparallel to inner edge, ectocaudal angle widely rounded and the caudal edge within rounded portion straight, the ectocephalic angle curved ectocephalad; the forceps stout, falcate in form, as usual, blackish. Maxillae II strongly chitinized, black; left outer plate with seven large teeth. The unpaired piece with ten much smaller teeth. Structure of other pieces not determined in type. In a paratype from Sta. 3417 the left plates of Maxillae II have respectively eight and ten (eleven) teeth, the right piece nine teeth; maxillae III have nine teeth. (Plate **54**, fig. 1).

Color in general dark brown, but the dorsum with a conspicuously contrasting, paler, yellow band along each side above parapodia, the parapodia and contiguous parts, including the cirri and branchiae, being of the same lighter color; the dorsum anteriorly and much of the venter has a reddish cast to the brown, but caudally the color becomes somewhat ferruginous.

LOCALITY. Off Panama: Sta. 3354 (lat. 7° 9′ 45″ N., long. 80° 34′ W.). Depth 322 fms. Bottom of green mud. Bottom temp. 39° F. 23 February, 1891. One specimen.

Off Panama: Sta. 3358 (lat. 6° 30′ N., long. 81° 44′ W.). Depth 555 fms. Bottom of green sand. Bottom temp. 40.2° F. 24 February, 1891. One specimen.

Off Mexico: Sta. 3417 (lat. 16° 32′ N., long. 99° 48′ W.). Depth 493 fms.

Bottom of green mud. Bottom temp. 40.6° F. 11 April, 1891. Two specimens.

This species in structure seems to approach *Leodice indica* (Kinberg) (*L. congesta* (Marenzeller)) closely. The gills have nearly the same structure and distribution, excepting that in the present species they begin farther forward (somite V) than usual in *indica* (usually somites VII to X, but rarely farther forward). The anterior apodous somites and the tentacles and cirri of the two species are very similar excepting in a few points, such as that the inner lateral tentacles are relatively longer. The present species, however, is a much larger and more robust form, with a strongly marked color-pattern which *indica* lacks. The jaws are larger and coarser; the carriers of the forceps are more uniform in width, not bulging caudally; the parts of maxillae II on the left side have more numerous teeth, with those of the outer piece stouter and seven in number as against ten on the inner, whereas in *indica* the numbers are more nearly equal in size and number (six and seven respectively in Marenzeller's type). The crochets seem also to differ in the form and direction of the teeth.

LEODICE LITA, sp. nov.[1]

Plate **54**, fig. 6–10; Plate **55**, fig. 1–7.

The general color is dull greyish brown, uniform above. Ventrally there are in the anterior region, but not in the median and posterior, three distinct longitudinal white stripes of which the median is fully twice as wide as the lateral; each lateral stripe runs close to the bases of the neurocirri. The tentacles, parapodia, and cirri are lighter than the body, but the contrast is not strong.

The body from the region about somite XII narrows strongly cephalad and more gradually caudad, behind the branchial region becoming much more slender, the caudal end rather abruptly subacute. Length about 80 mm., the hardened and much coiled condition of the type making wholly precise measurement difficult. Greatest width, exclusive of parapodia, 4 mm. Total number of somites near two hundred and forty-two. The sexual region lies caudad of the first one hundred and ten somites.

The prostomium is of moderate length, nearly equalling the peristomium. It is divided in front as usual by a vertical median incision. Each lobe is transverse, with inner end thickest and surface but little uneven. The tentacles are arranged in a weakly curved transverse series with their bases in contact with the peristomium, or partly covered by the latter. There is a distinct short ceratophore, but otherwise the tentacles seem to be wholly unjointed, smooth. All are broken off distally.

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[1] λιτός, simple.

The peristomium in length about equals the succeeding three somites. Dorsally the anterior margin bulges forward convexly at the middle. The surface is finely longitudinally wrinkled. The anterior margin on each side is notched, a furrow extending from each notch with a branch extending caudoventrad and one strictly ventrad, the border elevated in front of the latter. The ventral portion or lower lip is wholly smooth, with its anterior margin deeply concave and entire.

The second somite is exceedingly short. It is distinct not only above and below, as usual, but also laterally, where it extends forward in a small triangular area. The cirri are smooth, subulate. They extend forward nearly to the anterior margin of the prostomium.

The somites from the third caudad bear parapodia. They are regular and undivided. They are very short, in the widest part of the body (near somite XV) being nearly sixteen times wider than long. Dorsally the anterior somites are strongly arched, the body here being deepest, while in the anterior portion of the branchial region they are depressed, again becoming more convex farther caudad. There is no trace of a median longitudinal furrow in the anterior somites, but in the branchial region one appears, at first wide and shallow and then sharply and narrowly impressed in the posterior sexual region. The somites from the second caudad to the midbranchial region are crossed by numerous longitudinal sulci, these disappearing from the middorsal region on the more posterior ones. Ventrally the somites are but weakly convex; there is the usual neural furrow which is wider and shallow anteriorly, in the branchial region becoming narrower and deeper like the corresponding dorsal furrow and fading out in the caudal region. Pygidium small; anus subdorsal. Anal cirri missing from type.

On the anterior somites the parapodia are prominent, distally rounded processes; but they soon become reduced and but slightly elevated. The notocirri arise high on the sides of the somites above the fascicles of setae. Anteriorly they are proximally stout, narrowing distad, and rather long, extending beyond the setae; caudad they become shorter and more slender and before the end of the branchial series is reached, they are reduced to pale, subulate processes minute in comparison with the branchiae; caudad of the branchial series they continue to the end as unusually fine, short filaments. The first neurocirrus, that is, the one of the third somite, is a short, stout, subconical process; and the second and third are intermediate between the first and the fourth; the fourth and immediately succeeding ones are long, cylindrical processes bearing apically a much smaller, irregularly conical lobe; this general form is retained toward the caudal region, but the cirri become shorter and shorter and are often constricted proximally; in the posterior region they again take on the conical form without distinction of a distal lobe, finally becoming very small and almost obliterated.

The typical acicula, as occurring throughout except in the most anterior region, are black, stout, straight, excepting for a slight curve distally, with the acute tip projecting among the bases of the setae, as usual. Only one aciculum occurs in each parapodium. The dorsal acicula are represented, in the anterior region at least, by a small fascicle of fine pale fibers extending into the base of the notocirrus. The first true aciculum that could be detected by surface examination is in somite XXV, in which the first crochet also occurs.

The setae are of the usual four types. The crochets occur first on or near the twenty fifth somite. Each crochet is very dark, blackish, excepting the colorless, nearly transparent tip. The shaft widens conspicuously distad halfway to the tip and then narrows to the teeth. Each is weakly doubly curved and bidentate, with the tips of the teeth directed caudad. The subapical tooth is large, straight, and acute. The apical tooth is very much smaller, being minute, nearly erect, and but slightly curved caudad. The transparent membranous guards extend over the teeth, rising convexly between the two and usually distinctly above the level of the apical one. (Plate 55, fig. 5). The compound setae of each parapodium form a separate ventral fascicle, as usual. They are coarse, with the shaft proximally cylindrical and of uniform diameter, but at the upper end suddenly strongly clavately widened. The appendage is distally bidentate. The apical tooth is long and rather slender, proximally erect and distally strongly curved or hooked; the subapical tooth is much smaller and is straight, relatively thick at base. The edge of the membranous guard is weakly convex between the subapical tooth and the subbasal angle; it does not rise above the apical tooth. (Plate 55, fig. 6). The setae of the dorsal fascicle are strictly capillary; no limbi or wings are detectable; long, tapering, finely tipped, the tip often curved, especially in the smaller ones. Among the capillary setae are the pectinate setae. These have the usual general form. The cuneate appendage is concave from side to side. At one end of the distal series of teeth is normally a much longer, lash-like process, or flagellum. (Plate 55, fig. 7).

The first branchia on the right side occurs on somite XVII, that of the left side on somite XVIII. They cease at or very near somite CXII, the somite not being determinable with certainty in the type. The first branchia is a short, slenderly conical, or subulate, simple process arising dorsally from the base of the notocirrus, which greatly exceeds it. Those immediately succeeding increase progressively in length, becoming more filament-like, and the sixth and succeeding ones exceeding the notocirri, in the posterior part of the series greatly so. The anterior branchiae are all simple filaments; the twelfth and thirteenth bifurcate below the middle; some of the immediately following ones are again simple, but most are bifid, the branching occurring closer to the base, while in the posterior portion of the series all are simple filaments again. (Plate **54**, fig. 6–10; Plate **55**, fig. 1).

The first pair of maxillae are thin and pale. The carriers are proportionately elongate and narrow; the piece formed by the two of them is narrowest at the anterior end where the sides are nearly parallel, the caudal region on each side moderately convexly bulging; an acute median incision between the halves caudally. The blades proportionately to the carriers are broad, projecting on each side widely beyond the outer edge of the latter. Each has the general sickle-shape usual in the genus. (Plate **55**, fig. 3). Maxillae II are also pale. The outer edge of each is bent upward and is a little reflexed at the extreme caudal angle, the elevated portion short, narrowing and disappearing rapidly cephalad. The caudal margin deeply excavated between the outer elevated angle and the inner caudal process, the outer angle projecting caudad nearly as far as the inner process. On the left one there are four stout, distally rounded teeth, on the right five, the teeth on each occupying a space decidedly shorter than the smooth edge proximad of them. The left paired plate of maxillae III bears seven small teeth, the right one eleven. The unpaired plate bears four (or five) teeth. The structure of maxillae IV was not made out clearly. The mandibles are pale throughout excepting the outer border of each masticatory plate, which is blackish. Each masticatory plate is broadly oblong in outline, a little bent caudad and with the angles rounded; the edges are wholly smooth, having neither processes nor incisions; the two meet at an acute angle in the middle. The stems, anteriorly as wide as the plates, narrow gradually and strongly caudad, the caudal portions curving away from each other. (Plate **55**, fig. 2).

LOCALITY. Marshall Islands. A single specimen came up on the anchor from a depth of 12 fms. ALBATROSS Exped. 1899–1900.

This species seems to be rather widely separated from the other Pacific forms in the character and arrangement of the branchiae, *e.g.*, in having the branchiae either simple or at most with two filaments, with the first one appearing far back (somites XVII–XVIII) and the series terminating near the middle of the length. Among the Pacific forms the species suggests *L. paupera* (Grube) in the weak development of the branchiae. In the latter species, however, the branchiae begin on the twenty fifth somite (twenty third parapodial), are in part three-branched, and extend nearly to the caudal end of the body. In that form there are in each parapodium from the twenty fifth caudad two acicula and two crochets instead of one of each, the teeth of maxillae II and III are fewer, and the somites are fewer,— one hundred and twenty-seven as against two hundred and forty-two.

LEODICE OLIGA, sp. nov.[1]

Plate 55, fig. 11; Plate 56, fig. 2–9.

Body in general dull brown, without markings; the tentacles lighter, somewhat yellowish; the cirri and branchiae but little lighter than body, of greyish cast.

The body is first slightly narrowed anteriorly, but it narrows moderately caudad from the region of about the fifteenth somite. It is unusually short, the total length of the type being nearly 16.5 mm. and the greatest width, exclusive of the parapodia, 2 mm. The total number of somites is eighty-two.

Prostomium divided in front by a moderately deep and narrow vertical median incision; each lobe subpyriform, with the enlarged end ectoventrad in position, with on its anterior surface a curved, sublongitudinal furrow nearer outer side and with ends curved mesad. The median or inner paired tentacles are in contact with the peristomium; each outer paired tentacle is inserted close to the base of the corresponding inner one, in front and but little ectad. The tentacles are all distinctly jointed, the articles short and rounded and the tentacles in distal portion submoniliform. The median tentacle reaches to somite XVI; it narrows from the base distad to the slender distal portion and consists of twenty-nine or thirty articles. Each inner paired tentacle is in form like the median but is much shorter, extending to the ninth somite and consisting of nearly twenty articles. Each outer paired tentacle is very short, reaching only to the second or beginning of the third somite. It is thinner proximally than the other and is relatively less attenuated distad. It consists of eight articles.

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[1] ὀλίγος, short, little.

The peristomium is as long as the next three and a half somites. The dorsal surface is smooth, or essentially so, showing but a few fine punctae and some very fine curving impressed lines. The anterior margin above is straight or slightly indented at the middle; the sides are not incised and there is but a fine weak longitudinal sulcus crossing the peristomium on each side. From near the anterior margin on each side a wide furrow runs ventrad and then convexly mesocaudad, setting off an elevated anterior border and the median area or lower lip. The anterior margin of the lower lip is widely and not deeply concave.

The second somite is distinct below and above but is fused laterally with the peristomium in the more common way. Each tentacular cirrus is a slender, tapered process extending about to the transverse sulcus in front of outer paired tentacle; it is strongly annulate, the articles being short, distinct, and eight in number.

The third and succeeding somites are regular and undivided, though some of the anterior ones show above a weak transverse sulcus nearer the anterior margin than the caudal. The somites are very short, those in the widest region of the body being from ten to eleven times wider than long. Dorsally the somites are convexly arched and moderate in height; those of the posterior two thirds of the body are crossed by a narrow, distinctly impressed, median, longitudinal sulcus. The venter is flat. It is crossed over the entire length by a narrow, very distinct, neural furrow.

The pygidium is obliquely truncate above; below it narrows to an angular caudal point. The principal anal cirri are long and strongly segmented, the articles short, and eleven or twelve in number.

The parapodia are moderate or short in length. They are compressed in the cephalocaudal direction, the more anterior ones less so, subcylindric in cross-section. In anterior or caudal view they narrow from the base distad to the subtruncate or weakly rounded setigerous apex, the upper side more oblique than the lower. The notocirri arise from the base of the parapodia above. Each is a slender, distally strongly acuminate process which is distinctly segmented throughout, the articles short but always considerably longer than thick. They decrease in size caudad as usual. The neurocirri of the first few pairs are long and subcylindrical, narrowed moderately caudad and with the small distal article not abruptly set off; the following somites have the basal article stouter and more uniform, while the distal article is abruptly very much more slender than the basal and relatively long, being about two thirds as long as the basal. In the middle region of the body the ventral cirri have become much reduced both in length and diameter and the basal article in particular has become relatively much smaller, each cirrus as a whole being a narrowly conical process, a form maintained to the caudal end of the body.

The branchiae begin on the parapodia of the seventh somite and exist on all subsequent ones to the end of the body, though on the last two pairs they are almost obliterated. The first branchia consists of a single filament which is a little shorter than the notocirrus, from the base of which it arises. The second branchia is bifurcate, two filaments arising from a short common stalk; the filaments clearly exceed the notocirrus. The succeeding four branchiae are similar, each consisting of two slender equal filaments increasing in length caudad, the sixth branchia falling but little short of reaching the middorsal line. From the sixth the branchiae decrease again in length and become much reduced in the middle region where they do not reach halfway to the middorsal line, and then again increase in size caudad. The seventh branchia consists of three filaments, the extra one apparently formed by bifurcation of the more dorsal of the two filaments in a gill such as the preceding one, the third filament arising on the outside of the stalk at a level below the other two; the eighth, ninth, tenth, and eleventh are similar to the seventh, and the twelfth to eighteenth, inclusive, are again bifurcate. The following branchiae are again composed of single filaments, their simple branchiae occurring on all parapodia of the remaining and greater portion of the body excepting on seven or eight pairs preceding the last six or seven pairs, on which they are bifilamentous, the last ones being again simple. The last few branchiae are much reduced. (Plate **56**, fig. 5–10).

The acicula proper are pale in color; the acuminate tips are narrowly rounded and project but moderately; those of each parapodium lying in rather close contact. The crochets extend obliquely through the parapodium and emerge close to the neurocirrus. They are easily broken off. They are rather stout and present the usual double curve in their free portion. Each is tridentate; there is a large conical subapical tooth at right angles to the axis and a much smaller apical tooth curved forwards and bearing well distad on its caudal side the minute third tooth or denticle. The membranous guard extends over the subapical tooth and rises angularly well above the level of the apical tooth. (Plate **51**, fig. 11). The crochets begin on the twenty fifth somite or a somite adjacent to it. The setae of the dorsal group are strictly capillary and non-limbate; they are distally finely pointed and the apical portion is often curved. The compound ventral setae are very much coarser than the capillary ones and than the corresponding ones in *E. makemoana*. The shaft of each is long and curved and at the end abruptly clavately widened as in *makemoana*. The distal piece is bidentate; the special tooth is rather slender and is moderately curved forwards; the subapical tooth is of moderate size, projects at right angles to the axis and is farther distad than in *makemoana;* the piece gradually widens proximad to the usual protuberance but does not have a distinct subbasal tooth, from the protuberance narrowing to the point of attachment as usual. (Plate 56, fig. 4). The pectinate setae have stalks of moderate length; the distal end is gradually clavately widened, the terminal piece being decidedly longer and relatively narrower than in *makemoana* and with the processes more even, the setae also being smaller. (Plate 56, fig. 3).

Maxillae II with eight teeth on the right piece. Maxillae III of the right side is a strongly curved plate bearing ten teeth; this is paired with two plates on the left side, the inner, more caudal, longer one of which has nine teeth, the other eight. The stems of the mandibles are short, narrowed caudad as usual, and well united anteriorly much as in the preceding form. The masticatory plates are white; they lie obliquely, their anterior margins making a reentrant angle of nearly forty-five degrees; the anterior margin of each has two incisions dividing it into three rounded elevations or teeth; there is also a weak indentation at the lower part of the outer end; the surface is striate. The blade of maxillae are of the usual general form, appearing a little more abruptly curved distally than in *makemoana*. The form of the carrier-plate could not be made out clearly; but it seems to be narrower across the caudal end than in *makemoana,* the form of which it approaches.

LOCALITY. Paumotu Islands: Makemo. One specimen from the coral at the bottom of the lagoon, depth 13 fms., 19 October, 1899.

This specimen represents a form undoubtedly close to *makemoana*. The fact that the collection embraces only a single specimen of one species and an imperfect one of the other, makes it very difficult to judge the extent of variation in characters and the precise relationship between the two. In the presence of various important differences, however, the two forms must be held as distinct. The most obvious difference is presented by the branchiae. In the present form these extend both farther forward and farther caudad, and in particular an anterior group and a smaller posterior group are branched, possessing two and three filaments instead of all being strictly simple. The peristomium is longer relatively to the succeeding somites. The tentacular cirri are distinctly longer, reaching the middle of the prostomium instead of only near the middle of the peristomium, and they are more distinctly annulate. The tentacles are decidedly longer and consist of more articles, the inner paired ones, *e.g.*, reaching the ninth somite instead of only the fourth and consisting of twenty articles instead of fourteen. The pectinate setae are much smaller and have the clavate apical piece relatively decidedly longer and narrower. In the compound setae the apical piece has the subapical tooth farther distad and relatively larger; and the setae as a whole are much coarser. The crochets are very close in size and structure. The mandible has its anterior margin distinctly dentate instead of essentially smooth, and the united pieces are proportionately broader.

Leodice oliga papeetensis, subsp. nov.

Plate 55, fig. 8–10; Plate 56, fig. 1.

This form is represented only by the anterior portion of one specimen. This fragment, consisting of thirty-seven somites, is about 8.5 mm. long, with a maximum width of 2 mm.

The general color is dark yellow without distinct markings. The tentacles, parapodia, cirri, and branchiae are paler, whitish.

The tentacles are slender and strongly annulate as in *oliga*, the articles similarly short and submoniliform. The median reaches somite XI and consists of twenty articles; it may have lost some terminal articles. The inner paired tentacle reaches somite V on one side and consists of fourteen articles; on the other reaches somite XI and consists of eighteen somites, the tip of the first evidently having been broken off.

The tentacular cirri are very slender and at present do not extend beyond the anterior margin of the peristomium.

The branchiae begin on somite VII, as in the typical form, as a simple filament, but unlike the condition in the type-form, this filament is very much shorter than the cirrus. (Plate 55, fig. 8). The second branchiae consists also each of a single filament which is very slender and much shorter than its cirrus, although clearly exceeding the first in length. The fourth and succeeding branchiae, to and including the fourteenth, consist each of two filaments which seem in all cases to be exceeded by the notocirri. (Plate 55, fig. 9). The branchiae from the fifteenth are again simple and decrease in size caudad so much as to be practically if not quite obliterated on the last parapodia of the fragment. (Plate **55**, fig. 10). Whether they appear again and increase in size farther caudad can only be conjectured.

The pectinate setae are very similar in general structure to those of *oliga;* but the end-portion is larger and widens more strongly, though not so abruptly as in *makemoana.* The compound setae are so far as can be detected, identical in structure and size with those of the species. The dorsal setae are capillary and drawn out to a very fine tip as in *oliga.*

The right maxillae II have seven stout teeth, the left six. The right plate of maxillae III have ten teeth and is paired with two plates on the left side, of which the inner has eight teeth and the outer one seven smaller teeth. The anterior border of the mandibles presents two rounded excisions as in the species.

Locality. Society Islands: Papeete. One incomplete specimen taken on the shore, 9 November, 1899.

The most obvious difference from the species is in the branchiae, which are throughout shorter than the notocirri instead of greatly exceeding them in the widest region of the body. They also seem to become obliterated toward the middle of the body, whereas in *oliga* they remain well developed throughout. The branched branchiae begin with the fourth and end with the fourteenth, instead of beginning with the second and ending with the eighteenth, and these seem to be uniformly bifilamentous instead of in considerable part trifilamentous. The pectinate setae differ in form as above described. The teeth of maxillae II and III differ in number. The constancy of these differences cannot be correctly estimated until more abundant material of the two forms has been studied.

Leodice pauroneurata, sp. nov.[1]

Plate **57**, fig. 8, 9; Plate **58**, fig. 1–9; Plate **59**, fig. 1–3.

Dorsum brown, of a weak reddish tinge anteriorly, a paler band along each side above parapodia; venter brown, paler along lateral portions, the parapodia and adjacent lateral region being similarly light. Tentacles and cirri light yellowish. Setae light yellow.

Total number of somites present in type, ninety-seven. Total length, 42 mm. Greatest width, exclusive of parapodia, 5 mm.

Prostomium deeply retracted into the peristomium, the bases of the tentacles being in contact with or embraced by the latter. The prostomium is deeply divided by a median incision into two lobes, the furrow continuing distinctly to the base of the median furrow; each lobe is oblique and is divided by a weak furrow into a larger inner and a smaller outer division. The tentacles are arranged in a semicircle in contact with the peristomium. The median tentacle has the apical portion broken off; as it is, it reaches somite VI; it is smooth, without annulations or wrinkles. The inner paired tentacles reach somite VII; they are a little more slender than the median and are strongly tapered; each has a wholly smooth proximal division embracing more than two thirds the total length, followed by three short joints, of which the first is more vaguely separated, the other two distinctly so. The outer paired tentacles, more slender than the inner ones, are very short, reaching only to somite II; each ends in two or three short articles, the longer proximal division being wholly smooth. (Plate 58, fig. 5).

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[1] *παῦρος*, small, few; and *νεῦρον*, filament.

The first somite, or peristomium, is dorsally about equal to the succeeding two and a half somites. Dorsally the anterior margin is smooth and evenly incurved and the dorsal surface is smooth. Laterally, where meeting the outer end of the prostomial lobes, there is a pronounced incision and furrow. The lower lip has its margin evenly incurved; its surface is wholly smooth excepting for two sulci which cross it longitudinally, one each side of the middle.

The second somite is distinctly set off above between the cirri and ventrally, but, as usual, is wholly fused with the first laterally. Above, it is shorter than the third somite. Cirri are short and slender subulate appendages which do not quite reach the anterior margin of the peristomium. Proximally each cirrus is smooth, while distally, over more than half the length, it is annulate, the annuli being short and only moderately distinct. (Plate 58, fig. 6).

The third and succeeding somites bear parapodia. They are regular and undivided excepting that the more anterior ones are each crossed above by a weak furrow separating off a much shorter anterior division. In the widest part of the body (near somite XII), the somites are about ten times as wide as long. Somites are strongly arched and are nearly smooth; from the seventh caudad they have a sharply impressed median longitudinal furrow. Ventrally the somites are but slightly convex; they are crossed longitudinally by a pronounced neural furrow. From the region of the twelfth somite the body narrows strongly cephalad and more gradually but decidedly caudad. The pygidium in the type appears to have been broken off so that its character and that of the anal cirri cannot be given.

The parapodia are short and bluntly rounded. The dorsal cirri are acuminate distad as usual. They are wholly smooth, showing no trace of annulations. They are longest in the anterior region, where, however, they are relatively but moderate, caudad becoming shorter and more slender. The ventral cirri in the anterior region consist of a stout, cylindrical, proximal, division and an abruptly narrower and very short, rounded, largely noduliform article. In the posterior region they are much smaller, taking on first a more slenderly cylindrical form with no distinct distal article, and then becoming reduced to a mere nodule.

Branchiae begin on the tenth somite and are present on all excepting the last three or four somites. The first branchia consists of two equal filaments springing from a short, thick, common base. (Plate 58, fig. 7). The second has two filaments, of which one is bifid. The third has also two filaments of greater length. (Plate 58, fig. 8). The fourth has three filaments, of which the median is longer than the laterals. The fifth has four filaments springing from a more elongate common stalk. The sixth and seventh have again three filaments, the eighth two, and the ninth, tenth, eleventh, and twelfth, three. (Plate 58, fig. 9). The thirteenth has four filaments, of which one is bifid at the tip and one bears a short lateral bud below its middle. (Plate 59, fig. 1). The fourteenth branchia has two filaments, the fifteenth, sixteenth, and seventeenth three, and the eighteenth again but two, the nineteenth and twenty first three (the twenty second missing), the twenty third to thirty first two, the thirty second one, the thirty third two, the thirty fourth one, the thirty fifth to thirty ninth two, the fortieth one, the forty first and forty second two, the forty third one, the forty fourth to forty seventh two, the forty eighth three, the forty ninth two and the fiftieth again three. From this region (fiftieth to sixtieth somites) caudad the branchiae show a decrease in length which in the last branchiferous somites is pronounced; most of them consist of three filaments, some of four. (Plate 59, fig. 2). Thus the number of filaments varies irregularly from one to four, one being least common, two and three the most common, the latter number predominating in the caudal region. The branchiae are always shorter than the cirri.

Acicula black, stout, distally acutely acuminate and a little curved, the tips freely projecting. Often transversely rugose below tip and sometimes appearing to have a barb on one side. Anteriorly the acicula are two in number, but in the posterior region there are often three. Dorsal acicula represented as usual by a small fascicle of transparent fibers extending to base of dorsal cirrus; in some cases in the posterior region the fibers are brownish. Setae of the usual four kinds. The dorsal setae are fine, cylindrical, and acutely pointed, strictly capillary and not at all limbate. Among these are the delicate, transparent, pectinate setae which are more numerous than usual. These have exceptionally long stalks. The appendages are rather narrowly cuneate; the teeth are extended into filaments which often curl toward the middle of the series and in some increase progressively in length from one end of the series to the other. (Plate 57, fig. 8). The compound setae, composing the conspicuous ventral fascicle, are much coarser than the other ones. Each presents a decidedly curved shaft which is conspicuously clavately widened distad. The shaft at its wider distal portion is strongly obliquely striate as usual. The distal division, or appendage, of the compound setae widens a little above the narrowed basal portion by which attached, and then narrows gradually distad; presenting a moderate subbasal angle but with no distinct tooth at that level; at the distal end is a suberect, moderately curved, terminal tooth or hook, below which is the larger subapical tooth projecting at right angles to the axis of the appendage. The edge of the transparent membranous guards is proximally straight or slightly incurved and finely, closely serrulate, bulging out above the subapical tooth and extending distinctly over and above the apical tooth; obliquely striate. (Plate 57, fig. 9). The crochets begin in the parapodia of the twenty ninth somite. These are stout, black, aciculiform setae extending obliquely across acicula proper in an ectoventral direction, with the tip emerging near the base of the ventral cirrus. Each as a whole is strongly curved, with the concavity ectad, the apical portion becoming straight or slightly curved in the opposite direction; at the tip are two bluntly rounded teeth covered, as usual, by the membranous guards. (Plate 58, fig. 1).

Maxillae light brown, black edged, not heavy. Maxillae I with plate formed by fused carriers, acutely notched behind, convex on each side, moderately narrowed distad, and then again widening; narrowly acutely incised along middle line anteriorly with a narrow furrow connecting anterior and posterior incisions; each half of plate concavely depressed. Each blade has the ordinary falcate form, moderately narrowed distad, with the tip bluntly rounded, upper surface nearly flat, or somewhat concavely depressed from side to side, the margins being more or less elevated. (Plate 58, fig. 3). Maxillae II with outer edge proximally elevated but not reflexed, or at most only very narrowly so; on right side with seven teeth, on left with six, decreasing in size proximad, the last being very small, all in type apically rounded; proximad of teeth a smooth, straight edge about equal in length to the dentigerous portion. (Plate 58, fig. 4). Maxillae III with margin crenate, the teeth being small and marginally rounded; left plate with eight teeth, right with ten. The unpaired plate not detected. Mandibles with masticatory plates large and white. Each is obliquely subovate, with the outer end rather narrow; anterior edge not at all dentate and outer end not incised. Stems of mandibles blackish; nearly straight, being but slightly curved caudally; conspicuously narrowed caudad, the caudal ends narrow and subacutely pointed. (Plate 58, fig. 2).

Locality. Off Galapagos Islands: Sta. 3401 (lat. 0° 59′ S., long. 88° 58′ 30″ W.). Depth 395 fms. Bottom, Globigerina ooze. Bottom temp. 43.8° F. 28 March, 1891. One specimen containing eggs in posterior segments.

While this species is like *L. contingens*, *L. nesiotes* and others of the same group in bearing branchiae continuously to or nearly to the caudal end of the body, it differs from them in having the branchiae rather arbuscular than pinnate and in the much reduced number of the filaments. The species has points of resemblance to the wide-spread *L. vittata* (Delle Chiaji). In the latter species, however, the branchiae begin much farther forward (somite V). The branchiae also are much larger than the much reduced ones of the present species and the filaments are more pinnate in arrangement. Its crochets differ in structure, as do the compound setae in some details. The first maxillae differ conspicuously in form, having the carriers strongly narrowed caudad, subtriangular, instead of being expanded semicircularly in this region.

Leodice nesiotes, sp. nov.[1]

Plate 57, fig. 6, 7.

Color brown of dilute chestnut cast, darkest along middorsal line. Tentacles, parapodia, cirri, and branchiae paler, more yellowish.

The caudal end of the type is missing, so that the total number of somites is uncertain. There are in the incomplete specimen one hundred and one somites. The length is 90 mm., and the greatest width, exclusive of the parapodia, is 5 mm.

Prostomium short, narrower than the peristomium; deeply vertically incised in the median line in front; each half very oblique, conspicuously wrinkled; the anterior surface deeply depressed so as to leave a higher dorsal wrinkle and a ventral marginal ridge. Tentacles of type rather irregularly annulate, though the transverse wrinkles may to some extent be due to partial drying. The median tentacle reaching to somite IX; the inner paired tentacles somewhat more slender than the median, but likewise reaching the ninth somite. The outer paired tentacles are very short, reaching only to the second somite, though the tips may have been broken off.

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[1] νησιώτης, islander.

Peristomium in length equalling or exceeding the succeeding three somites. Indented at the median line in front, the anterior edge extending farther forward laterally and ventrally. Dorsally conspicuously ribbed longitudinally. Ventrally transversely wrinkled and the lower lip crossed by longitudinal sulci. Lower lip mesally deeply incurved.

Somite II apodous as usual. Distinct dorsally and ventrally, but laterally completely fused with somite I. Dorsally longitudinally ribbed. Cirri slender, weakly annulate, extending but slightly beyond anterior margin of peristomium. The succeeding somites bearing parapodia. Regular and undivided. Dorsally strongly convex; with a sharply impressed median longitudinal furrow, this less distinct anteriorly; longitudinally costate, the impressions distinct laterally, fading out toward the middorsal region, and becoming less distinct, or absent in caudal region. Ventrally only weakly convex; with a deep median longitudinal neural furrow. Body becoming widest at or near the twenty sixth somite. In this region the somites are five times wider than long. From this point the body narrows strongly cephalad and is narrowest at the third somite; caudad it remains of nearly uniform width to the caudal region, where it narrows very gradually.

Parapodia of the usual short and simple type. Neurocirri in anterior region with conspicuously swollen bases, ovate in outline, and short, subconical, apical divisions; caudad they undergo the usual change, the basal division becoming smaller and not abruptly separated from the tip. Notocirri long, much exceeding the neurocirri; thick proximally, but subulate and slender distally.

The branchiae begin on the ninth somite and continue throughout most or all of the length (the caudal end of the type is missing and the presence of branchiae on the somites of that part is uncertain, though probable). They are throughout unilaterally pectinate; they are moderately long, moderately exceeding the cirri, and, when laid against the dorsum nearly reach to the middorsal line; they are not erect, the flattened stalk being rather weak and showing a tendency to curl; filaments simple, unusually short and relatively wide, flattened and often curling. The maximum number of filaments noted in the type is fourteen. The number seems to remain high (near twelve) throughout most of the length.

A bundle of fine, fiber-like, pale acicula extending into base of notocirrus. Principal acicula black, stout, distally acutely pointed, gently doubly curved distad; the tips projecting freely among the bases of the dorsal setae; two in number in each parapodium. Setae of four kinds. The dorsal capillary setae compose a rather small fascicle. The setae are transparent, fine, and narrowly winged. Among these are the fine, transparent pectinate setae. Each of these has the usual delicate stalk bearing the cuneate or subcampanulate head, the free edge of which is finely pectinate, each tooth extending into a slender, curving filament of considerable length. The compound ventral setae are coarse and are yellow in color. The shaft of each is curved, with the concavity ventrad, and is strongly clavately widened distad. The appendage, or blade, is short and is tridentate, there being a distinct subbasal tooth in addition to the two distal ones. The apical tooth is subvertical and gently curved; the subapical tooth is large, subconical, and its axis makes a considerable angle with a line at right angles to the axis of the blade; the subbasal tooth has its upper line nearly horizontal; the membranous guard bulges a little between the subbasal and subapical teeth and extends over the apical tooth, ending a little above the level of the tip of the latter in a low point; edge of guard apparently smooth. (Plate 57, fig. 7). The crochets, occurring in the parapodia of the middle and posterior regions are stout and black in color. Each, as usual, extends obliquely across the acicula, its distal end lying near the base of the neurocirrus.

The mandibles have the masticatory plates large, oblique, subelliptic and white, each notched at the exterior end but with the anteromesal edge wholly smooth; stems black, stout, attenuated caudad, weakly united anteriorly. (Plate 57, fig. 6). Maxillae II heavy, black, the left with five stout teeth additional to the angle at anterior end of proximal smooth edge, the right with six. Maxillae III on left side with six teeth additional to a reduced one at angle of the smooth proximal edge; right plate with ten teeth. The unpaired left plate with four teeth.

Locality. Marshall Islands. Depth, 12 fms. Expedition of 1899–1900. A female specimen containing eggs came up on the anchor of the Albatross.

In the character and arrangement of its branchiae this species belongs in the same group as *L. contingens*. From that species and from *L. bilobata* it is at once distinguishable by its much longer branchiae and the shorter, less crowded, filaments of the latter. In general structure it resembles *bilobata;* but the incomplete description of the latter, due to imperfection of the type, makes a wholly satisfactory conclusion as to their relationship difficult to draw. An important difference appears to be in the tentacles, which are wholly smooth in *bilobata*, but are jointed in *nesiotes*. *L. multipectinata* differs in its shorter tentacles, with the median and inner paired ones distinctly unequal, in lacking a distinct subbasal tooth on the blade of the compound setae, etc. *L. antennata*, so wide-spread in the Indo-Pacific region, and the Japanese *L. microprion* differ, among other features, in having the branchiae begin farther forward. The Philippine *L. flavofasciata* also differs in having the branchiae begin on somite VII, in having the tentacles wholly smooth, etc. The Pacific Ocean species having pectinate branchiae throughout the length of the body may be separated by the following:

Key.

a. Branchiae beginning on somite IX.
b. All branchiae distinctly shorter than the dorsal cirri................*L. contingens*, sp. nov.
bb. At least the more posterior branchiae considerably longer than the dorsal cirri.
c. Tentacles unjointed, wholly smooth............................*L. bilobata* (Treadwell).
cc. Tentacles jointed.
d. Inner paired tentacles much shorter than the median, the latter reaching to somite VII; appendage of compound setae with no distinct submedian tooth. *L. multibranchiata* (Moore).
dd. Inner paired tentacles equalling the median in length and reaching to somite IX; appendage of compound setae with a conspicuous submedian tooth.........*L. nesiotes*, sp. nov.
aa. Branchiae beginning cephalad of somite IX.
b. Tentacles wholly smooth.
Body covered with interrupted yellow bands...................*L. flavofasciata* (Grube).
bb. Tentacles annulated.
c. Annulations strongly marked, and tentacles in part moniliform; the articles numerous and short; crochets tridentate....................................*L. antennata* Savigny.
cc. Annulations of tentacles weak; crochets bidentate.
d. Joints of tentacles long and few; first branchia with three filaments, on somite VI; right maxilla II with five teeth, right maxilla III with seven....*L. microprion* (Marenzeller).
dd. Joints of tentacles short and numerous; first branchia with but one filament, on somite VII; right maxilla II with eight teeth; right maxilla III with ten teeth. *L. panamena*, sp. nov.

LEODICE PANAMENA, sp. nov.

Plate 59, fig. 4–8; Plate 60, fig. 1–5.

The type is incomplete, the posterior region being lost. The anterior fragment, consisting of seventy-three somites, is 30 mm. long, with a maximum width, exclusive of parapodia, of 4 mm. The body is widest at the caudal end of the fragment from where it narrows gradually cephalad, a little more strongly narrowing at the anterior end.

The general color of the body is brown without markings. The tentacles, cirri, and branchiae are very dilute yellow.

The prostomium is a little more than half as long as the peristomium, than which it is considerably narrower. It is strongly bilobed, the median vertical incision being deep and acute. The lobes widen in subpyriform manner from above ventrad. On each a smaller dorsal lobe is vaguely separated from a much larger ventral one. The median and inner paired tentacles are arranged in a transverse row in contact with the edge of the peristomium, while each outer paired tentacle is distinctly farther forward and in front of the black eye-spot, which is partly covered by the border of the peristomium. The median tentacle has lost the tip and reaches only to the third somite. The inner paired tentacles, which also may not be complete, reach to the same somite. The outer paired tentacles do not reach fully to the caudal edge of the peristomium. The tentacles are all annulate throughout their length, the articles all being short and relatively broad, with the constrictions between them not deep. The articles are more distinct distally than proximad. The ceratophores are short and not thick; from them the antennae widen to about the end of the first third and then narrow strongly distad.

The peristomium is nearly of the same length as the next three somites together. It is smooth dorsally. The anterior margin above is nearly straight excepting for a shallow median excavation opposite the base of the median tentacle. On each side the anterior margin is slightly notched, and from the notch a short sulcus extends caudad. The lower lip is nearly smooth, except for a few weak transverse sulci. Its anterior margin is widely but not deeply incurved, and is smooth.

The second somite, which is apodous, is fused with the peristomium laterally, but is distinctly set off dorsally and ventrally. The tentacular cirri are stout at base, strongly narrowing to a point distad; they are short, scarcely extending beyond the anterior margin of the peristomium. Annuli are only very vaguely indicated.

The third and succeeding somites, which bear parapodia, are regular and wholly undivided. The third is longer than the second, the others increasing in length to the sixth inclusive, after which a number become shorter before the ordinary length is again resumed. At the widest part of the type, or near the seventieth somite, the somites are about nine times wider than long. Dorsally the somites are moderately convexly arched, the arch not being high. From the eighth somite caudad there is a median longitudinal depression, or furrow, which is most distinct anteriorly. The venter is weakly convex. From the fourth somite caudad there is a distinct neural furrow of moderate width and depth.

The parapodia are very small, subcylindrical and distally rounded processes. The notocirri are not jointed, though some of them may give the impression of a very vague, irregular annulation; they are stout at base, from which they taper strongly to a point. They increase in length from the first to about the twelfth, where they extend near halfway to the middorsal line when laid back against the body. They become shorter and more slender caudad, the base or ceratophore appearing there especially abruptly thicker. The neurocirri are short. The first four to six appear subconical with the base constricted and the terminal article continuing the outline of the proximal without abrupt change. The cirri then become stouter and cylindrical, with the small terminal article abruptly very much narrower. They continue of this form to the end of the fragment.

The branchiae begin on somite VII and occur on all subsequent somites to the end of the fragment. Excepting the first, they are of the unilaterally pectinate type. The filaments arise at an angle of about forty-five degrees to the stem, and the terminal filament is parallel with the others. The individual filaments are shorter than the notocirrus. Each of the first branchiae is a simple, unbranched, slender filament shorter than the notocirrus. (Plate 59, fig. 4). The second branchia on the left side has four filaments, the right apparently but three. Of these four filaments the one next the last is longest, the first and last the shortest. (Plate 59, fig. 5). The third branchia is likewise composed of four filaments similarly related, but they are distinctly larger than in the second. The fourth has six filaments, the fifth seven, the sixth has six primary filaments, but of these the second gives off two lateral branches of which the proximal one is much the longer, making the total number of filaments eight, the maximum number noted. (Plate 59, fig. 6). In the thirty eighth and fortieth branchiae the number of filaments has again fallen to five. The forty second branchia has four filaments, the number that prevails on succeeding branchiae to the seventy third somite, the last present in the type, though only three filaments occur in some. (Plate 59, fig. 8). The filaments are nearly always entirely simple, the branched condition being exceptional. The branchiae are erect, usually curling away from the body rather than lying against it. When stretched back against the body the longer branchiae fail much of reaching the middorsal line.

The acicula proper are pale in color. They are comparatively slender and each has distally a double curve, the more distal curve being the more pronounced. The tips project freely beyond the surface of the parapodium, as usual. The single crochet, as usual, extends within the parapodium obliquely across the acicula and setae to emerge at the base of the neurocirrus. It curves moderately ventrad, *i.e.*, is convex ectodorsad. At the tip it is bidentate, presenting the ordinary, suberect, stout apical tooth and a very stout, somewhat conical, subapical tooth, which in outline has the upper edge convex, the lower concave. The membranous guards rise above the level of the apical tooth and narrow to a subacute angle at the tip. (Plate 60, fig. 1). The pectinate setae have the ordinary general structure. Each presents a delicate stalk bearing distally an elongate, narrowly cuneate appendage, the distal edge of which is finely pectinate. At one end of the series of teeth is a more elongate process, or mucron, of moderate length. (Plate 60, fig. 3). The principal dorsal setae are capillary; they are non-limbate and distally reduced to a very fine tip which is usually moderately curved. The compound setae of the ventral group are much coarser than the capillary type. In these the shaft is long, gently curved, and of nearly uniform diameter to near the distal end where it enlarges subclavately; on the convex side, toward the distal end, the border is crossed by fine, oblique sulci giving the edge a weakly serrate appearance. The distal piece is distally bidentate, presenting an erect apical tooth and a basally broad, low, conical subapical tooth. The subbasal prominence is low and rounded with, in outline, a short horizontal upper edge, so that it often appears like a blunt tooth. The membranous guards rise considerably above the level of the tip of the apical tooth and narrow to a point distally. (Plate 60, fig. 2).

The maxillae are blackish in color and are well chitinized. The mandibles are also blackish excepting the masticatory plates, which are white. The mandibles are relatively narrow across the anterior end. The masticatory plates relatively short from side to side. Their projected anterior edges meet at a very obtuse angle, but little less than one hundred and eighty degrees. The edges are straight and are but finely and very weakly wavy, presenting no distinct teeth or excisions. Each plate at its outer end has the usual slight indentation. The stems are nearly straight. They are broad, narrowing from the middle caudad and diverging from each other. (Plate 60, fig. 4). Maxillae I have the piece formed by the united carriers very elongate. It is narrowest anteriorly, the nearly straight sides diverging moderately caudad and rounding in about the ectocaudal corners, the caudal end convex. The carrier has its upper surface somewhat concave. The blades are broad, especially proximally, and are distally rather abruptly incurved and falciform. Maxillae II have the ecto-caudal corners elevated as usual, but the elevated portion is short and rolled in only a short distance. The right maxilla has eight somewhat recurved teeth, of which the one at each end is reduced. The left has but five similar teeth. The right maxilla III is a strongly curved plate bearing along its free edge the teeth. It is paired with two plates on the left side, of which the more anterior has but six similar teeth and the more posterior, lying close along maxilla II, has seven larger teeth comparable to those of maxilla II. Maxilla IV has a single tooth.

LOCALITY. Near Panama. Shore. Exped. 1891. One specimen.

This species is at once separated from the widespread *L. antennata* Savigny, which it in many ways resembles, and its near relatives in having the crochets bidentate instead of tridentate. Aside from important differences in setae, maxillae, etc., it differs from *L. multibranchiata* (Moore) and *L. nesiotes*, sp. nov., in having branchiae begin on somite VII instead of on IX, and also the first branchia is composed of but a single filament instead of seven or more. In the character of the branchiae and notocirri the species is very similar to *L. microprion* (Marenzeller). It is like that species in the prevalence of four filaments to the branchiae, in having the maximum number of filaments eight, and in the general order in which reduction takes place. It differs in having but one filament in branchia I instead of three and in having this on somite VII instead of VI. It also differs conspicuously in the form of the carrier-plate of maxillae I, which is relatively much longer and the sides of which are nearly straight instead of being strongly incurved; the blades are much more strongly curved as judged from Marenzeller's figure (Denskchr. K. akad. wissensch. Math. nat. klasse, 1879, **41**, p. 135, pl. 5, fig. 1c). Maxilla II of the right side has eight teeth instead of five and the left side five in place of six, the contrast between the sides being thus much more pronounced. The unpaired left plate has seven teeth instead of but four, and the right maxilla III ten instead of but seven, the left six instead of four. See also p. 256.

LEODICE CONTINGENS, sp. nov.[1]

Plate **57**, fig. 1–5.

The type is brown throughout, the color being nearly uniform and presenting no distinct markings.

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[1] contingere, to border, touch.

The number of somites in the type is one hundred and twenty-two, of which the last thirteen are apparently regenerated. The total length, exclusive of the anal cirri and the tentacles, is nearly 116 mm. Greatest width, exclusive of parapodia, 6 mm., to tips of setae, about 9.2 mm.

Prostomium broad, protruding laterad on each side; deeply sunken into peristomium, the exposed portion short. Anteriorly deeply vertically incised, leaving a thick palpus on each side. Palpi strongly diverging from above ventrolaterad; each slightly indented, presenting a smaller border above the indentation and a larger thicker one below it. Tentacles arranged transversely in a semicircle, the laterals on each side rather closer together than to the median, the outer lateral inserted much farther forward than the inner. Tentacles mostly smooth, or but vaguely wrinkled distally; each with a very short but distinctly separated ceratophore; tips slender. Median tentacle reaching to somite VIII; inner paired tentacles reach to somite VI; outer paired tentacles much shorter, reaching only to the edge of somite III.

Peristomium in length equalling the next three somites. Anterior border indented on each side; below the indentation is the thickened lower lip, the margin of which is concave and is crossed longitudinally by sulci, appearing crenulate.

Somite II apodous. Fused laterally with somite I, but again distinct ventrally. Cirri more slender than tentacles, long and subulate, reaching forward to anterior third of exposed portion of prostomium; weakly wrinkled or annulate, more distinctly so distally. Somites from III caudad bearing parapodia. All regular and undivided. In widest part of body near six times wider than long, while in the posterior region the width may be less than three and a half times the length. Somites strongly arched above; smooth; ventrally nearly flat, with the median neural furrow distinct but not deep. The body attains its greatest width near somite XI or XII. It decreases in width very gradually caudad to the posterior end, where it narrows more abruptly to a point. Pygidium subtruncate; below the anus arise two smooth, subulate cirri 6 mm. long.

Parapodia of the usual simple form, moderate in length. Neurocirri in the anterior region with conspicuously thickened bases which in ventral view are oblong in outline; the more slender tip is a short, bluntly conical process; posteriorly the bases become less swollen and the apical portion more cylindrical. Notocirri notably long, being in the anterior region four or five times as long as the parapodium; smooth, tapering to a point distad. In the posterior region the notocirri are more slender and are relatively longer.

The branchiae begin on somite IX and occur on succeeding somites to the end of the body, excepting on the last two or three. They are short and inconspicuous, being exceeded in all cases by the cirri; erect and mostly free from the dorsum. They are throughout unilaterally pectinate, the stem arising from base of notocirrus and slenderly tapered. Filaments arising nearly at right angles to the stem, close and often crowded, parallel, slender, two thirds or less the length of the cirrus. They are simple but often branch a little above origin into two filaments which are usually equal but may be unequal in length. The first branchiae have four or five filaments, the second about eight, the fifteenth, sixteen or seventeen, counting the terminal extension of the stem, of which two are divided near their origins, making the total number of filaments eighteen or nineteen, and the thirty second branchiae have again but eight or ten filaments. (Plate 57, fig. 2).

The acicula are black and opaque. In the anterior parapodia there are two acicula with their tips, which are paler, projecting among the bases of the dorsal setae and two or three much finer and closely appressed acicula extending into the base of the notocirrus. Farther caudad the dorsal acicula become reduced to a small and inconspicuous fascicle of fibers. The two ventral acicula are stout and black throughout, with their tips projecting farther than in the anterior parapodia; the tips are acutely pointed, and are either straight or very weakly curved. The setae are comparatively long, all clearly exceeding the neurocirrus, though much shorter than the notocirrus. Those of the dorsal fascicle are much longer than the ventral ones. In the dorsal fascicle the principal setae are about twelve in number. They are distinctly margined or winged along two sides; the distal end is narrowed to an acute point and is curved; they are obliquely striate, though the striae are not always pronounced. (Plate 57, fig. 3). Among the limbate setae are the much shorter pectinate ones. These have the usual slender stalks bearing the cuneately widening distal bodies which are finely pectinate along the distal margin; the marginal process, or mucron, borne at one edge is fine and short, or but moderate in length. The less numerous setae of the ventral fascicle are compound. Their shafts are moderately curved and are strongly clavately widened distad; the appendages are short and distally bidentate, the upper tooth in the form of a hook, the inferior one much larger and projecting at right angles to the axis of the process; process widening proximad, with no distinct basal tooth; the usual delicate guard, which, but slightly or not at all, extends beyond the tip of the process; its edge very finely denticulate. (Plate 57, fig. 5). In each parapodium of the middle and posterior regions there is a largely black aciculiform seta, the crochet, running obliquely and projecting at the base of the neurocirrus. It is narrowed and curved at the tip, where it ends in a low, usually blunt tooth, below which is a much larger one. (Plate **57**, fig. 4).

Jaws rather heavy, hard, and black. Maxillae I with carriers firmly united into a rounded, laterally bulging, suborbicular plate; the blade just above base on ectal side with a projecting angle or tooth, above which it is of the ordinary falcate form; the blades have but little free motion, being closely united proximally and clasped by large reflex processes from the second maxillae. Maxillae II heavy; teeth six, stout, or seven, including a small, imperfectly separated, proximal one. Both plates alike, the teeth largest distad, preceded proximad by a long smooth edge. (Plate **57**, fig. 1). Maxillae III of left side with one plate bearing four small teeth, the other seven; plate of right side longer and bearing nine teeth.

Locality. Galapagos Islands: near Hood Island, Ripple Point. Sta. 4642 (lat. 1°, 30′ 5″ S., long. 89° 35′ W.). Depth 300 fms. Bottom temp. 48.6 F. Bottom of broken shells and Globigerina. 7 November, 1904. One female turgid with eggs.

In having pectinate gills over the entire length of the body this species is like the following reported from the Pacific Ocean: *L. antennata* (Savigny), *L. microprion* (Marenzeller), *L. flavofasciata*, (Grube) *L. bilobata* (Treadwell), and *L. multipectinata* (Moore). From *L. multipectinata*, known from off the southern Californian coast, the species differs, among other points, in having the dorsal setae strongly winged instead of being wingless, in having the blade of the compound setae differently formed, the maximum number of gill-filaments larger, the tentacles not distinctly annulate, the anal cirri but a single pair and these strongly tapered. From *L. bilobata*, an Hawaiian Island form, the species differs in having the paired tentacles relatively decidedly shorter, in the different structure of the compound setae, etc. The present species in general structure seems to approach *L. microprion* rather closely; but it differs, for example, in having the branchiae begin on IX instead of on VI and in having a much larger maximum number of gill-filaments (seventeen or nineteen instead of but eight) and in the larger number of teeth on the paired plates of maxillae III.

ONUPHIDIDAE.

As in the Leodicidae, to which the present family is very close and with which, consequently, it is often united, the body is elongate and vermiform, composed of numerous simple somites, and with a smooth and iridescent skin.

The prostomium differs from that of the Leodicidae in bearing always two frontal tentacles in addition to five posterior ones, the total being uniformly seven. Palpi present. Eyes two, or none.

The peristomium differs from that of the preceding family in being uniformly entire, with no trace of biannulation. Tentacular nuchal cirri may be present as a single pair, or absent.

Branchiae either present or absent, when present either simple filaments or variously branched. Parapodia and setae in general as in the Leodicidae, as are the other more important structural characters.

Unlike the Leodicidae, almost all members of this family occur at considerable and great depths, a number of species, such as *Leptoecia abyssorum* (p. 320), occurring below the two thousand fathom line. The tubes are sometimes composed exclusively of the hardened secretion from the animal, as is the case with the remarkable, tough, horny and hyaline, quill-like tubes of Hyalinoecia giving the name to that genus. In other cases the secretion forms but a comparatively thin lining membrane strengthened with a wall composed of various foreign objects, such as the long fibers, or spicules, of vitreous sponges, as in the case of *Onuphis sombreriana* McIntosh, the shells of various Foraminifera and similar forms, as in the case of *Paronuphis solenotecton* (p. 310), or simply of fine mud, as in *O. proalopus*, sp. nov., and *O. cobra*, sp. nov.

Key to Genera.

- *a.* Branchiae present.
  - *b.* With tentacular cirri.
    - *c.* The frontal tentacles long and slender like the others.................. *Heptaceras* Ehlers.
    - *cc.* Frontal tentacles short, stumpy.
      - *d.* With especially long simple setae in first three pairs of parapodia. . *Rhamphobrachium* Ehlers.
      - *dd.* Without long simple setae on first three setigerous somites.
        - *e.* Branchiae simply cirriform or pectinate; eyes small, point-like, between median and posterior paired tentacles on each side.......... *Onuphis* Audouin and Milne Edwards.
          - *f.* First two pairs of parapodia not prolonged.
          - *ff.* First two pairs of parapodia prolonged, extending forward beneath the prostomium. *Paranorthia* Moore.
        - *ee.* Branchiae in the form of a brush or plume, the filaments spirally arranged, the largest ones at the anterior end of the series; eyes large, between unpaired tentacle and median lateral on each side.......................... *Diopatra* Audouin and Milne Edwards.
  - *bb.* No tentacular cirri; branchiae cirriform........................... *Hyalinoecia* Malmgren.
- *aa.* With no branchiae.
  - *b.* With tentacular cirri.
    - *c.* Eyes large, each between unpaired tentacle and median lateral one of corresponding side. *Paradiopatra* Ehlers.
    - *cc.* Eyes small, punctiform, each situated laterally between the median and posterior lateral tentacle.. *Paronuphis* Ehlers.
  - *bb.* With no tentacular cirri.. *Leptoecia*, gen. nov

ONUPHIS Audouin and Milne Edwards.

Hist. nat. litt. France. Annélides, 1834, **2**, p. 151; QUATREFAGES, Hist. nat. annelés, 1865, **1**, p. 350; EHLERS, Borstenwürmer, 1868, p. 296; MCINTOSH, British annelids, 1910, **2**, pt. 2, p. 404.
Northia JOHNSTON, Cat. annelids Brit. mus., 1865, p. 136.
Nothria MALMGREN, Annulata Polychaeta, 1867, p. 66.
Tradopia BAIRD, Journ. Linn. soc. London. Zool., 1869, **10**, p. 355.

The species of Onuphis described below may be separated by means of the following:

Key.

a. Branchiae all simple.
  b. Branchiae beginning on the sixth parapodia; median tentacles shorter than the posterior paired ones.. *O. lepta*, sp. nov.
  bb. Branchiae beginning on the fourteenth parapodia; median tentacle longer than the posterior paired ones.
    c. Crochets of first parapodia composite; most branchiae as long as or longer than the notocirrus, which in no case reaches halfway to the middorsal line; carrier of maxillae I broad caudally.. *O. crassisetosa*, sp. nov.
    cc. Crochets of first parapodia simple; all branchiae decidedly shorter than the notocirri which are long, some almost reaching middorsal line; carrier of maxillae I pointed behind, triangular.. *O. cobra*, sp. nov.
aa. Branchiae, at least in part, branched.
  b. Anterior hooded crochets tridentate.
    c. Branchiae beginning on the sixth parapodia; first parapodia extending directly forward well beyond middle of prostomium............................... *O. proalopus*, sp. nov.
    cc. Branchiae beginning on the fifth parapodia; first parapodia oblique, not passing middle of prostomium... *O. nannognathus*, sp. nov.
  bb. Anterior crochets bidentate.
    c. Branchiae beginning on the seventh parapodia.................. *O. litabranchia*, sp. nov.
    cc. Branchiae beginning on the sixteenth or seventeenth parapodia.
      d. Branchiae beginning on the sixteenth parapodia; ceratophores of tentacles widest at middle, narrowed at both ends; end piece of pectinate setae short and broad. *O. pachytmema*, sp. nov.
      dd. Branchiae beginning on the seventeenth parapodia; ceratophores strictly cylindrical; distal division of pectinate setae very long and narrow............ *O. socia*, sp. nov.

ONUPHIS PROALOPUS, sp. nov.[1]

Plate **40**, fig. 3–8; Plate **41**, fig. 1–10.

The general color is brown, paler on each side in a stripe adjacent to the parapodia, these with their cirri and branchiae being yellowish. In the anterior region there is a somewhat obscure middorsal and midventral longitudinal whitish stripe. The tentacles are yellow.

The type lacks the posterior portion. The fragment present is 65 mm. long with a maximum width, exclusive of parapodia, of 2 mm. It consists of one hundred and eighty-two somites.

[1] *προᾰ́λης*, springing forwards, and *πούς*, foot.

The prostomium is wide in proportion to its depth, in anterior view being transversely elliptic in outline. It is comparatively long, being dorsally twice as long as the peristomium. The surface in general is smooth; there is a vertical sulcus on the anterior face from between the frontal tentacles ventrad. The palpi are large and conspicuous, thick and subconical, distally rounded. They are contiguous mesally. Each extends outward beyond the side of the prostomium. The tentacles are arranged in a transverse ellipse. The frontal tentacles are separated by less than half their proximal diameter; they are subcylindric and distally rounded. The dorsal tentacles are each composed of a conspicuous, distinctly annulate and strictly cylindrical ceratophore and a long, smooth style which proximally is as thick as the ceratophore, but gradually tapers distad. The anterior paired tentacles reach to the fifth somite; the ceratophore consists of five very short articles and a distal smooth division clearly more than a third but less than half the total length; the style, stout at base, tapers to a fine point. Each posterior paired tentacle is inserted midway between the corresponding anterior tentacle and the median tentacle, and reaches to somite XVIII or XIX; the ceratophore is a little longer than that of the anterior paired tentacles and consists of six short articles proximally and a smooth distal division less than half of the total length; the style narrows very gradually and uniformly to an acute tip. The ceratophore of the median tentacle is shorter than that of the posterior laterals, being nearly equal to that of the anterior laterals; it is composed of five short proximal articles and the usual smooth distal division; the style is of the same form and nearly of the same length as that of the posterior laterals. (Plate 40, fig. 3).

The peristomium dorsally is very short, being in the middorsal line not more than half the length of the prostomium or of the length of the second somite. On each side it projects conspicuously forward to embrace the prostomium. The lower lip is abruptly elevated above the level of the lateral surface on each side and is sharply limited; it is broad and but slightly narrower caudad than across the anterior end; the anterior margin is in the form of a very obtuse V with the apex, which is caudad, narrowly truncate and each arm at its extreme outer end curving a little more directly ectad; there is a subquadrate area outlined on the middle of the surface by weak furrows. (Plate 40, fig. 5). The tentacular cirri are long and slender, each reaching forward beyond the bases of the frontal tentacles. (Plate 40, fig. 3).

The first few metastomial somites are rather strongly arched dorsally, the arch becoming wider and lower caudad. Ventrally the somites are moderately convex throughout. Most somites, excepting the first few, are a little depressed along the middorsal line and also along the midventral line. Intersegmental furrows deep and distinct. The first and second metastomial somites are about equal in length, which is nearly the same as that of the prostomium, and are about three times as wide across the anterior end as long. The third metastomial somite is shorter in about the ratio eleven to thirteen. It shows a distinct transverse sulcus, there being only a weak transverse depression on the first two. The succeeding somites do not show a distinct transverse sulcus. They gradually decrease in length to the seventh, which is between five and six times wider than long and which is scarcely more than half as long as the first metastomial. The following somites maintain practically this same actual length throughout most of the fragment, the most caudal ones, however, being shorter in about the ratio of five to seven.

The first parapodia are cylindrical and very long, and extend almost directly forward along the sides of the peristomium and prostomium beyond the middle of the latter and very nearly to its anterior end, the cirri projecting beyond the anterior end. The notocirrus is attached above, a little proximad of the middle, has a narrowed cirrophore, just above which it is moderately thickened, and then tapers to a point. The neurocirrus, attached on the ventral side, and nearly opposite to the notocirrus, is similar in form, but is smaller. There is only a slight presetal elevation, whereas there is a tapered, cirrus-like, postsetal process as long as the neurocirrus. (Plate 41, fig. 3). The succeeding five pairs of parapodia are similarly attached to the anterior border of their somites but project less directly cephalad and are shorter though still comparatively long. (Plate 41, fig. 4). Beginning with the sixth, the parapodia, now attached at middle of length of somite, extend more ectad, at the eighth directly so, at the same time becoming greatly shortened. (Plate 41, fig. 4). At the same time they are shifted dorsad and at the eleventh attain the dorsal level which is maintained thereafter. Caudad the postsetal process gradually becomes shorter, appearing only as a short, thin lobe and finally quite absent caudad of the eighteenth parapodia. The notocirri in the most anterior parapodia are long and slenderly tapering, reaching to or slightly beyond the middorsal line. They continue to be prominent on all parapodia, but posteriorly they become extremely slender and filamentous while maintaining the same or nearly the same length. The neurocirri are well-developed, tapering processes on the first seven pairs of parapodia. Beginning with the eighth parapodia they are reduced to flattened scutes merging in the glandular area.

Branchiae first appear on the sixth parapodia and continue to be strongly developed on all subsequent parapodia to the end of the fragment (somite CLXXXII). The first and second branchiae are unifilamentous, each filament slender, tapered, and nearly equalling the notocirrus in length. The third to seventh branchiae, inclusive, are bifilamentous, the branch arising proximad of the middle and projecting forward at an angle of about forty-five degrees from the principal filament. (Plate 41, fig. 8). The eighth branchiae on the left side is trifilamentous, a second branch springing from the caudal side between the base and the first branch at a similar angle, while the right branchia is bifilamentous. The ninth branchia on the left side, on the contrary, is bifilamentous, while that of the right side is trifilamentous. (Plate 41, fig. 9). Subsequent branchiae acquire four and then five or sometimes six filaments, these in the middle region of the body being, like the notocirri, long and surpassing the middorsal line, while their arrangement is prevailingly unilaterally pectinate. (Plate 41, fig. 10). Five filaments is the number maintained almost exclusively in the branchiae excepting in the most anterior ones and some irregularities in the most posterior, which are also shorter.

The so-called dorsal acicula consist of a fascia of slender setae or fibers extending into the base of the notocirrus. The ventral acicula are arranged in a series, often of four. They are dark brown in color, and stout, distally finely pointed, the colorless tip projecting freely from the surface. (Plate 40, fig. 6). On each of the first five pairs of parapodia there occurs a series of stout compound crochets in which the joint is distinct. Each is distally tridentate, the apical tooth much larger, suberect, but curving distally outward beyond the others, which are short and project nearly at right angles to the axis. The membranous sheaths rise well above the apex, but are not prolonged into a slender tip. (Plate 41, fig. 7). In addition these anterior parapodia bear a small dorsal group of limbate setae. These are short and very finely tipped, expanding near the middle of the exposed portion, where they are narrowly limbate, and again a little narrower proximad of this. On the sixth parapodia the compound crochets are replaced by stout simple setae, which are distally attenuated to a very fine tip. Farther caudad the true crochets make their appearance, these normally two, but sometimes three, in number in each parapodium. These are dark in color. The exposed portion of each is narrowed distad to a neck-like constriction below the teeth, which are two in number. The lower tooth is much the larger and is nearly transverse. The upper one, vertical proximally, is abruptly curved distally. The membranous guards scarcely exceed the teeth, and the distal edge is straight and runs obliquely from one tooth to the other. (Plate **40**, fig. 8). The pectinate setae are transparent and delicate; the stalks are usually very long, variable in length; the expanded distal piece is large, in outline somewhat cuneate but asymmetrical, one side being oblique and prolonged, the edge of the other diverging but little from the axial line; the distal edge is a little oblique, its teeth nearly uniform in length. (Plate **41**, fig. 2). The setae of the dorsal group are comparatively short and slender; each is slenderly tapered to a fine tip, more or less bent near middle of exposed portion, and is narrowly limbate. The ordinary ventral setae are coarse, a little bent or curved and drawn out distally to a fine point; they are narrowly bilimbate. (Plate **40**, fig. 7).

The maxillae are thin and translucent, irregularly blackish on part of the edges. Each carrier-plate of maxillae I is at the anterior end incurved, the remaining greater portion of the plate being semicircular, with the convexity ectad, but the plate as a whole narrower than long, narrowly acutely incised at the middle line posteriorly, the edges dark, the dark area more extensive on each side of the caudal incision. The blades are slenderly and evenly tapered distad, the distal end strongly curved mesad. The outer left plate of maxillae II has eight teeth, the inner one nine somewhat smaller ones, and the right plate ten teeth which are acute and retrorse and decrease in length gradually and regularly proximad. The right maxilla III is a long plate paralleling II proximally, where it is smooth and edentate, but strongly curved ectad anteriorly and on the curved portion bearing a series of ten erect straight teeth; the left maxilla II is a shorter, less curved piece bearing only seven teeth. Each maxilla IV bears a single tooth. (Plate **40**, fig. 4). The mandibles are small and weakly developed, only slightly chitinized. The masticatory plates are small and transparent, with the edges smooth.

The single tube in the collection is incomplete. The part present is 75 mm. long and has a maximum diameter of 5.25 mm. It consists of the usual thin lining membrane covered with a uniform layer of fine mud.

Locality. Off Peru: Sta. 4653 (lat. 5° 47′ S., long. 81° 24′ W.). Depth 536 fms. Bottom of dark brown volcanic mud. Bottom temp. 41.3° F. 12 November, 1904. One specimen in its tube.

This species is like *mannognathus*, sp. nov., and *vexillaria* Moore in the weak development of the mandibles and in other general structural characters. It may readily be distinguished by the very long first parapodia and in having the branchiae first appear on the sixth parapodia, as well as by other details throughout. It is a much more slender species.

ONUPHIS NANNOGNATHUS, sp. nov.[1]

Plate **43**, fig. 8–11; Plate **44**, fig. 1–5.

This species is represented in the collection only by the anterior region of a single specimen. This fragment is composed of one hundred and nineteen somites, so that the number in the complete animal must be very large. The fragment is 64 mm. long, with a maximum width, exclusive of parapodia, of 4 mm., the species being robust.

The body is dark brown. On each side just above the parapodia a longitudinal band of whitish yellow, which may extend mesad a variable distance in a line along the edge of each somite, and anteriorly on a limited number of somites a median longitudinal white line. Ventrally on each side there is a broad yellowish band running from the fifth somite caudad over the glandular areas at bases of parapodia. The tentacles are dark like the body, but the branchiae and cirri are much paler, being light yellow.

The prostomium is very short; subcylindrical, but flattened on the ventral side. Dorsally the usual median longitudinal sulcus is only vaguely indicated. The tentacles are arranged at the circumference of a transverse subelliptic area. Ventrally a median longitudinal sulcus running caudad. The frontal tentacles are prominent, subconical, distally rounded processes which at present are contiguous at base, though, as the specimen seems considerably shrunken, this may not be the condition in fresh specimens. The palps are large bodies contiguous at the middle and elongate transversely. The dorsal tentacles consist, as usual, each of a conspicuous, strongly annulated ceratophore and a long smooth style. The inferior paired tentacles, if stretched back against the body, reach somite IV. The ceratophore of each inferior paired tentacle consists of six or seven very short but strongly marked annuli and a long smooth distal division about one third the total length; it is cylindrical throughout. The style is stout, and is pointed at the tip. The upper paired tentacles reach to or near somite XVII. The ceratophore of each has nearly the same diameter as that of the lower paired tentacles, but it is considerably shorter; it consists of five or six very short, distinct articles, of which the most proximal is largest, and a long, smooth, or but vaguely wrinkled distal division. The style, stout at base, is strongly attenuated distad, the distal portion fine. The median tentacle is equal in length to, or slightly longer than, the upper paired ones. Its ceratophore is also of nearly the same thickness and length as that of the adjacent paired ones; it consists of five very short articles, of which the most proximal is somewhat larger than the others, and a smooth distal division which is decidedly more than one third of the total length. The style is like that of the adjacent paired ones.

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[1] *νάννος*, dwarf and *γνάθος*, jaw.

The peristomium is much thicker than the prostomium, being conspicuously higher, the dorsal surface rounding up from the anterior edge to the caudal. On each side the border protrudes forward convexly and embraces the sides of the prostomium. The lower lip is strongly and abruptly elevated and then sharply set off both laterally and caudally; the anterior margin is mesally deeply excised, the excision broadly V-shaped, with the outer part of each side curving ectad. The cirri are long and slender, each extending beyond the distal ends of the ceratophores of the tentacles.

The first metastomial somite is higher and much longer than the peristomium. The second and third metastomial somites are shorter than the first and about equal to each other, and they are high and strongly convex like the first, though the dorsum of the third slopes somewhat downward caudad. The dorsum of the fourth continues the downward slope. At the sixth or seventh somite the minimum depth of the body is attained, the dorsum of these and succeeding somites being only slightly convex and crowned by a shallow median longitudinal furrow. The venter throughout is weakly convex, and is traversed by a conspicuous neural groove. The glandular area, prominent on each side of all but the most anterior somites, is typically very elongate transversely, with the mesal end narrowed more or less to a point. From about the twenty fifth somite the body narrows forward, the narrowing at the anterior end being very strong; caudad the width remains nearly uniform to the end of the fragment. The first somite is about three fourths as long as its greatest width exclusive of the parapodia; the second one half as long as wide; while the twenty fifth and succeeding somites, which, like all excepting the first few are very short, are about nine times wider than long.

The parapodia of the first three pairs are attached at the anterior border near the ventral level and, as usual, are directed somewhat forward, those of the second and third pairs somewhat less so than the first ones. These parapodia are stout, cylindrical, and moderately long. Beginning with the fourth parapodia they are attached near the middle of the length of the somite, project transversely, and begin a shift dorsad, so that by the twelfth they are at the dorsal level; at the same time the parapodia undergo a decided shortening. In the first parapodia, the notocirrus, attached proximad of the middle, is tapered from the base distad, flattened, and long, extending forward well beyond the bases of the posterior ceratophores; the neurocirrus is attached at the base of the parapodium on the ventral side and is similar in form to the notocirri, but shorter; in front of the series of setae there is a distinct but short, flap-like, distally convex, presetal lobe, this being much exceeded by the setae, while behind the setae there is a very long cirriform process, about equal in actual length to the neurocirrus. In succeeding parapodia the presetal lobe soon quite disappears as such. The postsetal process caudad gradually decreases in length, the distal portion soon being represented only as a short, pointed process from a broad basal flap like the presetal lobe farther forward; and in this form of a thin lobe bearing a short pointed piece distally, the postsetal processes continue to the end of the fragment with no essential further change. The notocirrus is present on all parapodia of the body; but caudad it rapidly becomes reduced and on all but the more anterior segments appears as a slender filament of uniform diameter, or nearly so, throughout its length. The neurocirrus continues as a long and conspicuous, tapering process to the seventh parapodia, except that the right seventh cirrus is much reduced in contrast with the left one, which is large; on the eighth parapodia the neurocirrus is reduced to a slight elevation and thereafter appears merely as merged in a scale in the ventral glandular area.

The branchiae begin on the fifth parapodia, each being a single slender, distally pointed filament arising from the base of the notocirri, and about equalling the latter in length. On the sixth parapodia the branchiae are similar. On the seventh, each branchia is bifurcate, the two filaments arising symmetrically from the base; on the right side one filament clearly exceeds the notocirri, but on the other side there is but little difference. On the eighth and ninth parapodia each branchia is similarly bifurcate, with the filaments but slightly exceeding the notocirrus. The tenth to fourteenth parapodia, inclusive, bear each a trifilamentous branchia, the inner two separating from each other higher up than the primary bifurcation. The next two branchiae have four branches. Following there are branchiae with five filaments and then with six, rarely more, eight being the maximum number observed. (Plate **44**, fig. 4, 5). The filaments in them arise in an essentially unilaterally pectinate manner, the filaments being at a very acute angle with the stem; they attain or sometimes a little surpass the middorsal line, thus very much exceeding the notocirri. Branchiae continue to the end of the fragment (CXIX somite), in the posterior portion of which the number of filaments is again four, the number that prevails.

The acicula proper are colorless; they are much more slender than the crochets, being comparable in thickness to the dorsal setae; a little above the surface from which they emerge, they become strongly narrowed, the tip being slender, acute, and a little curved. The setae of the dorsal fascia are numerous and conspicuously long and capillary; distally they become reduced to a fine, distally acute, distinctly curved tip; they are scarcely at all limbate, the wings very narrow, short, and usually obscure. (Plate **44**, fig. 8). The pectinate setae occur among the capillary setae as usual; they are delicate, transparent structures, with a long, thread-like stalk, bearing distally a cuneate plate which projects out widely from the axis on one side but remains nearly straight on the other, being thus strongly asymmetrical. The processes of the distal edge are of uniform length. (Plate **43**, fig. 11). The crochets are normally two in number, erect, narrowed below the teeth; bidentate, the lower tooth larger and transverse, the other one much smaller, proximally erect, distally curved outward above the other; fibrillae distinct, extending distad to the base of cervix and a few short ones evident opposite the lower tooth; the distal ends of the membranous guards rise from the lower tooth to an angular tip just above the upper tooth. (Plate **43**, fig. 9). On the first parapodium there is a more dorsal group of finely tipped, non-limbate, capillary setae and a ventral group of coarser, composite, distally dentate setae or crochets. In these the joint is moderately distinct. The distal article is short; it is tridentate, the upper tooth short, curved distocephalad, the two lower teeth short, bluntly rounded, the lowermost being shortest; the membranous guard rises but little above the upper tooth. Farther caudad, *e.g.*, upon the sixth parapodia, coarse unjointed setae with a prolonged, flexible, soft, fine tip appear, these a little farther caudad wholly displacing the jointed forms and then themselves disappearing. (Plate **44**, fig. 2).

Carrier-plate of maxillae I about equal in length and breadth; widening from anterior end to about middle of length, where each side projects in an obtuse angle, and from there the plate narrows to a caudal angle, at the apex of which it is acutely incised. The usual triangular anterior area on each half is distinguishable as a paler region set off caudoectally by a ridge or fold in the plate. The blades are narrowed suddenly at about the end of the first third and again at the end of the second third, beyond which the distal portion is bent strongly mesad; as a whole slender. The right blade in the type has a short tooth or accessory process on the ectal side at the beginning of the distal third. Maxilla II of the right side has nine acute, in part reflexed, teeth, and one obtuse one at the proximal end of the series, or a total of ten. The right maxilla III is a strongly curved plate presenting a slender, straight, edentate arm extending proximad and a curved distal portion bearing a series of nine teeth. The right maxilla IV is a triangular plate in which the anteromesal corner is acute and is turned up as a tooth-like process. (Plate **43**, fig. 8). The left maxillae are injured and partly missing, so that their description cannot be given. The mandibles are small, unusually thin, membranous and flexible, and in general weakly developed; anterior margins meeting at an obtuse angle, smooth and straight; stems weak.

Locality. Gulf of California: Sta. 3431 (lat. 23° 59′ N., long. 108° 40′ W.). Depth 995 fms. Bottom of light brown mud. Bottom temp. 37° F. 20 April, 1891. One specimen.

This species seems to approach *O. vexillaria* Moore, dredged by the Albatross off the southern Californian coast at two stations at depths of 243 to 280 fms. (Sta. 4326 and 4401). It is a more robust species with the somites shorter in proportion to length. The branchiae begin on the fifth parapodia instead of on the fourth. The maximum number of branchial filaments is smaller, being six instead of twelve, and the branchiae remain branched as far back as somite CXIX, whereas in *vexillaria* they have already become unifilar in front of L. The tentacles are longer, the posterior laterals, *e.g.*, reaching somite XVII instead of only to X. In *vexillaria* the median tentacle is shorter than the posterior laterals, with the ceratophore also clearly shorter, whereas in the present species the median tentacle is longer than these laterals with the ceratophore equally long. The right maxilla III in the present species has nine teeth as against six in *vexillaria*. The compound crochets have essentially the same structure; but in the ordinary crochets the apical tooth is distinctly longer and more erect and the guard is clearly differently shaped. The distal edge of the pectinate setae is much less oblique.

ONUPHIS LITABRANCHIA, sp. nov.[1]

Plate **50**, fig. 7; Plate **52**, fig. 1–10; Plate **52**, fig. 1.

This is a very slender and elongate species which is flattened dorsoventrally and is of nearly uniform width except at the ends where it narrows cephalad and caudad respectively. The type, which is broken into six pieces and is not wholly complete, has an aggregate length of about 167 mm., and a second complete but similarly broken specimen has nearly the same length (165 mm.). The greatest width, exclusive of the parapodia, is only 2 mm., the depth varying from 1 to 1.5 mm. The total number of somites counted in the fragments of the type is two hundred and twelve, the number in a paratype two hundred fifty, or above.

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[1] *λῑτός*, simple, and *βράγιχα*, gills.

The general color is yellow, the sides, including parapodia and cirri, paler and the nerve cord showing as a narrow, white, median ventral line sometimes appearing broken into spots corresponding to the ganglia.

The prostomium small, very short proximally, subcylindrical, its outline in anterior view nearly circular, but with lower part of circumference somewhat flattened. Its surface is largely occupied by the bases of the seven tentacles which are arranged in a circle. The surface encircled by the bases of the tentacles is indented or depressed, the impression being more or less transverse, and the surface below this region protruding forward and bearing the frontal tentacles. The frontal tentacles are very short, broad, flattened dorsoventrally and distally subtruncate, or with distal edge a little incurved. They widen from the base distad, being prolonged distoectally. At the base they are only very narrowly separated, nearly contiguous. The dorsal tentacles all have long stout ceratophores bearing very slender, distally finely attenuated styles. The ceratophores are essentially smooth, only in part obscurely wrinkled and not obviously articulate. The tentacles of the anterior pair reach to or somewhat beyond the middle of somite III. In these the style is nearly twice as long as the ceratophore; it is rather abruptly thickened at the base in contact with the ceratophore. Tentacles of the posterior pair reaching somite IX. In these the ceratophore is decidedly longer than that of the anterior. The style is similarly enlarged proximally and is more than three times as long as the ceratophore. The median tentacle reaches upon somite III, or nearly to IV, being of essentially the same size as the anterior paired ones, with ceratophore and style of similar form and proportions. The enlarged proximal ends of the styles are lighter in color, whitish. (Plate 51, fig. 1).

Peristomium distinctly wider and higher than the prostomium, bulging smoothly outward and upward from its line of contact with the latter. It is only weakly produced forwards at the sides. Dorsally there is a low median longitudinal ridge which at its anterior end projects as a low triangular process against the prostomium, a sulcus running from the tip of the triangle on the prostomium to the base of the median tentacle. The lower lip is set off on each side by a sulcus that runs obliquely caudomesad; its anterior border is straight and smooth. The cirri are very small, distally pointed processes not reaching the middle of the prostomium or the base of posterior paired ceratophore. (Plate 51, fig. 1).

The anterior metastomial region is high, dorsally strongly convexly arched, but ventrally flat. The height rapidly decreases to the fifth (fourth parapodial) somite, caudad of which the somites are strongly flattened dorsally as well as ventrally. The first three podous somites are only rather vaguely separated from each other above; each is widest across the anterior end at level of origin of the parapodia from where it narrows caudad, and is two thirds as long as wide at that level. The fourth somite is abruptly and relatively shorter, the succeeding somites remaining similarly short but gradually increasing a little in width to about the tenth, from where the width does not vary much until toward the posterior end. The fourth, fifth, and immediately succeeding somites are only about half as long as wide. The intersegmental furrows continue to be faint, excepting laterally, between the parapodia. There are the usual thickened, whitish glandular areas below the level of the parapodia, the integument elsewhere rather thin and semitranslucent.

The parapodia in the anterior region are but moderately prominent structures, becoming shorter caudad. They begin on somite II near the ventral level and occupy the same position on III and IV. With somite V they begin a shift dorsad and at somite X they have attained the dorsal level. The first two pairs of parapodia, which are attached at the anterior end of their somites, slope strongly forward. The third parapodia slope forward less strongly and the fourth extend straight out. On the remaining somites the parapodia are attached near the middle of length and are much shortened. The first parapodia are rather stout. Each bears a notocirrus, neurocirrus, and, between these, a setigerous lobe which presents a low and inconspicuous presetal lip and a moderately elongate, subcirriform, postsetal lip which is, however, much shorter than the notocirrus or neurocirrus. The neurocirrus arises on the ventral surface near the base and reaches to or a little beyond the base of the postsetal process. The notocirrus arises on the dorsal surface nearly opposite the neurocirrus; it is constricted at its base, swelling out above this and then tapering to the distal end; it is of about the same length as or but little exceeds the neurocirrus, but it is somewhat stouter; they fail decidedly of reaching the middorsal line. (Plate 51, fig. 7). Caudad of the third pair the parapodia proper rapidly decrease in size, and the style or process proper practically disappears.

The postsetal process is markedly shorter on the second and third pairs, and soon is a mere point and then essentially absent on the ninth parapodia. The neurocirrus similarly becomes quickly reduced to a mere nodule and then obliterated. The notocirri continue throughout the length of the body, but in the middle and especially the posterior region have become shorter and much more slender.

Branchiae first appear on somite VIII, the first appearance on this somite being uniform so far as observed. The branchiae in the type are throughout undivided, excepting the one case noted below, each consisting of a single filament arising on the dorsal side of the base of the notocirrus. Each of the first branchiae is a slender filament of uniform diameter, more slender than the notocirrus but much exceeding the latter in length; it does not reach the middorsal line. (Plate **51**, fig. 8). Caudad the filaments increase in length, attaining the middorsal line at or near somite XIII–XV and then a little farther caudad surpassing it, the branchiae of each pair overlapping across the dorsum. (Plate **51**, fig. 9, 10). Then the filaments again decrease in size and fall short of reaching the middorsal line in the middle and posterior region. The right branchia of the twenty first somite, unlike any other in the type, divides a little above the base into two branches and one of these, which is somewhat the stouter, again bifurcates toward the tip. In a paratype, however, beginning at somite XXXII, and continuing on about the succeeding fifteen somites, the branchiae are regularly bifilamentous, the bifurcation occurring a little above the base; in many of these one filament again bifurcates higher up, or it may have three branches. Caudad of this region the branchiae continue of the unifilamentous form as in the type. (Plate **52**, fig. 1).

The neuropodial acicula seem to be mostly from three to five in number. They are of the same color as the setae, but are much stouter. They first narrow gradually distad and then more abruptly, the free tips being very slender, long, and acute and commonly more or less curved; they emerge among the bases of the dorsal setae. The notopodial acicula, when detectable, appear as slender, inconspicuous fibers entering the base of the notocirrus. (Plate **51**, fig. 2).

The principal setae of the dorsal fascicles are long, slender, and of uniform diameter until toward the distal end, where they narrow to a very slender, fine, and acute tip, the narrowing portion of the setae being ordinarily curved, the fine tip more strongly so; each of these setae is distinctly bilimbate, each wing rather narrow, beginning a little proximad of the narrowing region of seta and continuing distad to fade out on base of the fine tip. (Plate **51**, fig. 3). Among the bases of these limbate setae are the delicate, transparent, and inconspicuous pectinate forms; these are few in number and extend but little beyond the level of the tips of the crochets in the segments where these are present; the end-piece of these is asymmetrically, narrowly cuneate in form, one edge being prolonged. (Plate 51, fig. 4). The crochets in each parapodium where present are two in number; each is stout, with the usual double curve, and is distally bidentate; of the teeth the apical or one on convex side of the neck is acute, with sides nearly straight, or the inner side a little convex and the tip of tooth slightly bent inward; the other is much stouter with sides similarly straight and its apex on a level with that of the smaller one and its outer edge parallel with that of the latter; the guards extend over and somewhat above the teeth. (Plate 51, fig. 5). The crochets begin on the thirteenth somite (twelfth parapodium). On the first and a few succeeding parapodia there are a few larger setae of the hooded crochet-type; these are moderately long and a little curved distad; each is bidentate, a single smaller accessory tooth lying considerably below the large, nearly erect, distal one; the guards are conspicuously prolonged, each being slender and with a fine tip. (Plate 51, fig. 6). On the immediately succeeding somites these crochets seem to be replaced by finely tipped, untoothed setae.

The maxillae are thin and mostly pale, dark pigment occurring on the borders adjacent to the suture between blade and carriers and that between the halves of the latter in maxillae I, and along the dentigerous borders of the other maxillae. Maxillae I have the carrier-plate narrowing from the anterior end caudad, *i.e.*, its posterior portion subtriangular, the caudal angle mesally narrowly incised; each blade is conspicuously curved distally in the usual way, and is broad proximally, but slender distally, where also it is somewhat darkened. Maxilla II on the left side in a paratype has eight long, slender, acute, and more or less retrorse teeth along its inner edge, the untoothed proximal edge short. The unpaired plate, which lies close to this plate within and parallel to it, bears nine similar teeth. The right maxillae II appears to bear the same number as the left, eight, though it is broken in the preparation examined, and one or more additional teeth may have been present. The left maxilla III bears four slender, acute teeth, the right seven. Maxillae IV with a single tooth. (Plate 50, fig. 7). The mandibles are comparatively small, thin, and delicate; the masticatory plates are narrow and elongate, their anterior edges minutely crenulate but not truly dentate, very oblique, their projections meeting mesally at an angle of about forty-five degrees; the stems rather slender and short, diverging caudad.

Locality. Off Mexico: Sta. 3415 (lat. 14° 46′ N., long. 98° 40′ W.). Depth 1,879 fms. Bottom of green mud. Bottom temp. 36° F. 10 April, 1891. Several specimens.

This species has a number of similarities to *O. nebulosa* Moore secured in Monterey Bay in much shallower water (65–71 fms.). In the latter species the gills begin similarly on somite VIII (or IX) and are largely simple, with bifilamentous ones frequent and a maximum number of four filaments; however, more of the gills seem to be divided and the longest of them just reach the mid-dorsal line instead of passing much beyond it. The anterior parapodia are longer. The postsetal process of the parapodia undergoes reduction much more gradually. The anterior crochets differ in having two accessory teeth instead of but one and noticeably in lacking the conspicuous prolongation to the guards. The posterior crochets differ perceptibly in having the lower teeth directed more nearly at right angles to the axis and making a decidedly larger angle with the apical tooth. The ceratophores of the dorsal tentacles differ in being distinctly quadriannulate. The maxillae are very similar in general appearance; the teeth of maxillae II are more numerous (ten instead of eight), and the left and right maxillae III have six and eight teeth respectively instead of four and seven in *litabranchia*.

Onuphis pachytmema, sp. nov.[1]

Plate **48**, fig. 5–11; Plate **49**, fig. 1–8; Plate **50**, fig. 1–6.

The general color is light brown, with a pale ventral neural stripe showing enlargements corresponding to the ganglia and also a light median longitudinal dorsal stripe excepting anteriorly; below each parapodium is a swollen, whitish glandular area; the cirri are pale.

A complete specimen in one piece was not secured. Three fragments of one specimen had a total of eighty-five somites and together measured 85 mm., the maximum width being 3 mm. A second specimen, also in three fragments, had also eighty-five somites, or very close to that number, a total length of 98 mm. and a maximum width of 3.25 mm. The body seems thus to be proportionately stout and rather short, widest in the middle region, where the width is nearly uniform, and narrowing at the ends, less conspicuously so at the caudal. The body is low, being compressed dorsoventrally.

The prostomium is somewhat hemispherical and is circular in outline in anterior view. It is depressed anteriorly between the bases of the frontal tentacles and is vaguely, finely, transversely wrinkled above between the posterior tentacles and the peristomium, and there is a weak median longitudinal sulcus between base of median tentacle and the caudal margin. The bases of the tentacles are arranged in a circle. The frontal tentacles are subconical, distally well-rounded processes, also constricted at very base, diverging from each other moderately and separated at their bases typically by about half their diameter; the prostomium beneath these is but slightly carried forward. The frontal tentacles have the usual long, stout ceratophores bearing the slender, finely attenuated styles. The ceratophores are all widest near the middle, narrowing toward both ends, and are composed of numerous very short annuli between which the constrictions are not deep or conspicuous. The tentacles of the anterior pair reach a little caudad of the middle of somite II. In these the style is twice as long as the ceratophore and is uniformly narrowed distad; the ceratophore is composed of seven very short annuli, of which the most distal is longest. The tentacles of the posterior pair reach to somite VII. In these the style is between five and six times as long as the ceratophore. The ceratophore is fully a third longer than that of the anterior pair and is much stouter; it consists of nine or ten very short articles, of which the ultimate is longer than the immediately subjacent ones, as usual. The median tentacle is much shorter than the posterior laterals, reaching only to about the beginning of the third somite. In this the slender style is nearly three times as long as the ceratophore. The ceratophore is much more slender and only about three fourths as long as that of the posterior laterals; it is composed of five articles. (Plate **49**, fig. 5).

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[1] *παχὺς*, coarse, *τμῆα*, segment.

The peristomium laterally continues the general outline of the prostomium, widening caudad. It is more abruptly elevated dorsally. The anterior margin above is angularly produced forward at the middle. Laterally the anterior margin is nearly straight. On each side a weak furrow runs back obliquely caudoventrad. The lower lip is strongly elevated; it is set off on each side by a depression running obliquely caudomesad from the outer anterior angle; its anterior margin is smooth, and widely, moderately incurved mesally. The tentacular cirri are short, slender, acuminate processes attached near the anterior margin and not reaching to base of the posterior tentacles. (Plate **49**, fig. 5).

The first two metastomial somites are strongly arched dorsally, the third decreasing in height caudad to the distinctly lower level of the immediately following somites. The peristomium is longer than the first podous somite, but is decidedly shorter than the first two together. Each of the first three metastomial somites is widest across the anterior end at the level of attachment of parapodia, narrowing to the caudal end. The length in these is about three fifths the greatest width. They are only obscurely marked off from each other dorsally. The third is separated from the fourth by a sulcus more distinct than that between those either in front or immediately caudad. The somites of the posterior median and caudal portions of the body are very distinctly separated above as well as laterally and ventrally. The fourth somite is much shorter and is two and a half times wider than long. From here caudad the somites increase in width to near the tenth, thereafter remaining more nearly uniform to the caudal region. The somites near the tenth are twice or a little more as wide as long. In this region they are decidedly flattened dorsoventrally, the dorsum being but weakly arched and the venter flat. The dorsum is somewhat more highly arched again in the posterior median region. The somites present the usual whitish, transversely elongate, swollen glandular areas below the parapodia.

The parapodia of the first three pairs are moderately prominent and project obliquely forward. They are attached at the anterior border of their respective somites near the ventral level. With somite V (fourth pair) they begin to be shifted dorsad, and at somite IX they have attained the dorsal level and at the same time have had the bases shifted back from the anterior border and are greatly shortened. The fourth parapodia project less strongly forwards and the succeeding ones extend out nearly horizontally. The first parapodia are stout. Each bears a notocirrus attached near the middle dorsally, a neurocirrus attached farther proximad on the ventral surface, and is distally extended into the setigerous neuropodial lobe which presents a conspicuous, cirriform, postsetal process. The notocirrus is slenderly tapered from the base as usual; it reaches less than halfway to the middorsal line; the cirrophore is low. The neurocirrus is similar in form to the notocirrus, but is somewhat shorter. The postsetal process does not extend out quite to the level of the tip of the notocirrus. (Plate 48, fig. 5). In succeeding parapodia the notocirri continue to the last, but decrease gradually in length and become much more slender, with the base in the anterior ones more constricted. The neurocirrus is much shorter on the second parapodia and on the third is but a rather short, conical body; on the fourth parapodia it is reduced to a low, rounded prominence and on succeeding somites it is a simple plate merged with the glandular swelling. The postsetal process is much reduced on the second and third parapodia and by the ninth has been reduced to a mere low, obtuse, angular projection and is not evident on the following ones. The presetal margin is not in any case especially elevated. (Plate 48, fig. 6, 7).

The branchiae first appear on the sixteenth parapodia, *i.e.*, on those of the seventeenth somite. Each of the first branchiae consists of a single rather stout filament a little exceeding the notocirrus in length. (Plate 48, fig. 8). The second branchiae are bifurcate, with the filaments either equal in length or one exceeding the other, or trifilamentous. The third and succeeding branchiae to about the seventeenth are mostly trifilamentous, a long filament arising on the anterior side close to the cirrus and making an angle of about forty-five degrees or more with the other branch, which bifurcates farther distad, the branches being either subequal or, more commonly, the caudal one smaller, often much so; rarely a branchia occurs with four branches. (Plate 48, fig. 9, 10; Plate 49, fig. 2). Caudad of this region the branchiae become mostly bifilamentous, one branch being greatly elongated and the other more and more reduced. (Plate 49, fig. 3, 4). In the posterior region the branchiae consist of a single slender filament which undergoes gradual reduction until represented by a mere nodule and finally quite disappears at about the twenty fifth somite from the caudal end. (Plate 48, fig. 11). In the region of the twentieth and immediately following somites the branchiae reach the middorsal line; at the thirtieth, and immediately following, the long filament passes beyond the middle line.

The dorsal setae of the anterior parapodia are slender and capillary, distally acutely acuminate, and not at all limbate. The setae of the dorsal group of the other parapodia are long, slender, and gradually reduced distad to a very fine tip; they are normally curved distally and each is limbate in the usual way, a narrow wing on the side of the convexity in the curved distal part beginning near or below the middle of the exposed portion of the seta and continuing to the base of the bristle-like tip. (Plate 50, fig. 4). The pectinate setae occurring among the bases of these limbate setae are short and delicate structures which are large comparatively; distally each is clavately enlarged, the cuneate apical piece being long, narrow, and asymmetrically prolonged distally on one side, as usual. (Plate 50, fig. 5). The ordinary crochets first appear on or near the tenth somite and occur on succeeding ones to the last of the series, there being normally two in each parapodium; they project more prominently in the posterior region. In the posterior region they are stout, narrowed distad, and bidentate at the tip; the apical tooth is very small and erect, the other much larger one projects nearly at right angles to it and has its very tip bent distad, its upper surface being slightly concave. The membranous guards rise broadly a little above the teeth. (Plate **49**, fig. 8). On the first three parapodia there are elongate jointed crochets, the articulation being far distad, and the second article short; distally the second article is bidentate, the subapical tooth small; the guards extend much above the level of the teeth and are narrowed gradually to a slender acute point distally. (Plate **50**, fig. 1). These are replaced on the fourth parapodia, etc., by coarse setae which are drawn out distally to a fine point and may or may not show an imperfect jointing. (Plate **50**, fig. 2). The ordinary ventral setae are finely pointed, distally curved, and narrowly shortly limbate on the convex side. (Plate **50**, fig. 3).

The acicula are of the typical form, each narrowing strongly at the distal end, and the protruding portion fine, subcapillary, and curved. (Plate **50**, fig. 6).

The maxillae are rather thin, light brown in color, with black edging. Maxillae I have the plate formed by the carriers narrowed across the anterior end, below which it bulges convexly on each side to narrow again caudally; there is an open V-shaped median incision from the caudal margin; an inverted, triangular anterior area on each half is thicker, as usual. The blade of each maxilla is proximally very broad, being abruptly much narrowed distad of the middle in a characteristic way. (Plate **49**, fig. 6). Maxillae II have the left paired piece bearing ten teeth; the unpaired plate has also ten teeth, with a smooth proximal edge longer than that of the paired plate. The right maxilla II has the distal process narrower and tooth-like, being curved mesad like the other teeth with proximad of it ten teeth, making the full number of teeth eleven. (Plate **49**, fig. 6). The number of teeth on maxillae III was not ascertained. The masticatory plates of the mandibles are large and obliquely elongate, with the distal angle subacute. The anterior edges of the plates meet mesally at an angle of less than ninety degrees; they are straight and smooth except for a single acute incision at about the middle of the length of each. There is a short incision on the outer end in the usual position. Especially on the caudal half of each plate striae parallel to the caudal margin are pronounced. The two plates are broadly in contact mesally. The stems taper and diverge caudad; they show striation rather distinctly. (Plate **49**, fig. 7).

Of the several tubes the longest measures near 460 mm., with a maximum diameter of 5 mm. The inner tube or lining consists of a tough, whitish, translucent membrane over which is the layer of fine, closely adhering mud, which is dark greenish grey in color.

LOCALITY. Off Peru: vicinity of Sechura Bay. Sta. 4658 (lat. 8° 30′ S.

long. 85° 30′ W.). Depth 2,370 fms. Bottom temp. 35.3° F. Several tubes with specimens *in situ* were dredged 14 November, 1904.

This species is clearly a very close ally of *O. ehlersi* and *O. armandi* of McIntosh which were secured by the CHALLENGER expedition off the Chilean coast at a depth of 2,225 fms. and midway between Kerguelen and Melbourne (53° 55′ S. and 108° 35′ E.) at a depth of 1,950 fms. From *ehlersi* it differs in general appearance, apparently, in being a decidedly shorter and stouter form with the somites longer. It differs uniformly in having the branchiae begin on the sixteenth parapodia instead of on the seventeenth, and in the greater length of these, many of which in the present species pass beyond the middorsal line, with the cirri relatively very small. McIntosh's figure shows the peristomium as shorter than somite II; in the present species the reverse is clearly the case. His figures show the carrier-plate of maxilla I to be proportionately broader and shorter and the blade to be less strongly narrowed distad of the middle. The anterior articulate crochets differ in details. The blade of the pectinate setae is relatively shorter, much broader, and less symmetrical.

From *O. armandi* the species differs in having the branchiae more strongly developed, trifilamentous branchiae occurring prevailingly from the nineteenth to the thirty fifth parapodia, whereas in *armandi* on the twentieth and thirtieth parapodia the branchiae are only bifilamentous and at the fortieth part have become reduced to single filaments. In *armandi* the first branchiae are bifilamentous, but in present species are uniformly simple. The carrier-plate of maxilla I is relatively very much shorter, that of *armandi* being but little shorter than the blades. The species differs from both of these species of McIntosh in having the anterior edge of the mandibles smooth excepting for a single acute incision. The carrier-plate of maxilla I is much shorter and the blade more abruptly narrowed distad. The setae differ in details, the pectinate setae, *e.g.*, having the distal expansion relatively much shorter and broader.

ONUPHIS SOCIA, sp. nov.[1]

Plate 47, fig. 1–11; Plate 48, fig. 1–4.

The general color is dilute brown of a pronounced green tinge; a paler middorsal and midventral longitudinal line, which may be discontinuous and not evident anteriorly, is more or less developed.

The type, Station 4672, the maximum specimen, has a length of 86 mm.

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[1] socius, associated.

and a maximum width of about 3.2 mm. It is composed of about one hundred and forty-five somites; but a large paratype from Station 4666 is 178 mm. long, and, though its width is the same as in the type, the number of somites is two hundred and seven.

The prostomium is short and subcylindrical, being slightly narrowed anteriorly and in anterior view circular in outline. Above it presents a median longitudinal furrow from the base of the median tentacle caudad; and in front the area within the base of the tentacles is flattened. The tentacles are arranged in a circle. The frontal tentacles are short, subcylindrical processes subconically rounded distad and sometimes a little constricted toward base; they are separated by rather less than half their diameter; the prostomium beneath them is but slightly carried forward. The frontal tentacles, as in allied species, consist each of a long ceratophore bearing a much more slender, finely attenuated style. The ceratophores are nearly strictly cylindrical and are strongly and closely annulate, the annuli being short and numerous, the constrictions separating them distinct, but often not deep. The tentacles of the first pair reach to the anterior half of somite II, their tips attaining the bases of the first parapodia, or in some cases reach toward the caudal end of the somite. In these the style varies from rather less than twice as long as the ceratophore to somewhat more than twice as long. The ceratophore in the type is composed of five annuli of which the most distal is longest and the two immediately proximad of it the shortest. The posterior paired tentacles in a paratype reach to somite VII, which is probably the usual proportionate length, but in some appear shorter. In the type they do not extend beyond somite III. The ceratophores are longer and much stouter than in the first pair; each is composed of six articles of which the most distal is longest and the three preceding it are shortest and subequal to each other; in the larger paratype from Station 4666 the ceratophore is composed of nine articles, the very short additional rings being found adjacent to the distal one.

The median tentacle, as in others of this group of species, is much shorter than the adjoining posterior laterals, reaching only to the third somite. Its ceratophore is decidedly shorter than that of the posterior laterals, being about equal in length to that of the anterior laterals, though decidedly stouter; it is composed of five annuli, of which the most proximal and most distal are longest. The palps are large, conspicuous bodies, stout, and subcontiguous at the median line and conically narrowed distad, the two diverging from each other, the axis of each extending ectoventrad.

The peristomium is longer and wider than the prostomium, its anterior border above and laterally being rounded down to the surface of the latter. It is a little longer than somite II (6:5 in type), or sometimes equal to it. Its surface dorsally and laterally is smooth. Down its anterior slope above there is a median elevation that projects triangularly against the prostomium in the usual way. On each side the margin protrudes forward broadly, convexly to embrace the prostomium. The lower lip is set off on each side by a deep and wide furrow extending from each side but little caudad of ventrad; its anterior margin as a whole is convex, but at the middle is conspicuously excised, the bottom of the excision straight, with a short sulcus running from each end of it obliquely caudoectad. The cirri are short acuminate processes reaching to or but slightly beyond the nearest point of the base of the corresponding posterior lateral tentacle.

The first three metastomial somites form a more or less sharply separated division of the body, characterized by a high, strongly convex dorsum, the fourth somite being very much lower, and the third somite dorsally sloping from the level of the second to that of the third. Caudad of the fourth somite the depth of the body again gradually increases, but caudad of the anterior third again becomes less, the body in the middle and posterior regions appearing typically decidedly flattened. The first metastomial somites are widest across the anterior end, as usual; the first in the type is two and a half times wider than long; the second is longer, in the type a little less than half (2.4:5) as long as wide, the third is also of about the same proportions. The fourth metastomial somite has the proportions of the first, being two and a half times wider than long. In a paratype these first parapodia-bearing somites have the same length and proportions. The somites from the fourth caudad are distinctly separated above as well as laterally and ventrally. The somites increase in width to about the fifteenth, then again narrow a little and remain nearly uniform over the middle region, though the caudal region gradually narrows, with the caudal end more abruptly acutely pointed. The fifteenth somite and adjacent ones, measured across between bases of parapodia, are nearly four times as wide as long, the somites in this and the following region being very short. The dorsum over the somites caudad of the fourth is marked by longitudinal sulci, one each side of the middle; between these the area tends to be lighter in color and the anterior edge protrudes forward more or less and may appear notched where crossed by each sulcus. There is a similar double sulcus along the ventral surface setting off a neural stripe, with a slight median protrusion of the anterior edge in each somite. The pygidium is a small, subconical body; the cirri are broken off.

The parapodia of the first three metastomial somites are, as in other species of this particular group, attached near the ventral level. They are moderately prominent and usually project forwards, though there seems to be some variation in this regard. The first parapodia are attached at the anterior border of their somite, the second and third farther caudad. The fourth parapodia are attached at the middle of the length of their somite, and they project more nearly directly outward. Beginning with this pair the parapodia begin to shift farther dorsad and at the seventh or eighth pair have reached near the dorsal level. At the same time they have become decidedly shortened and now project dorsad or a little ectad of dorsad. The first parapodia are moderately stout. Each bears a notocirrus, attached at its base above, which is proximally swollen out above a somewhat constricted base and is then uniformly tapered to an acute tip and is rather long, reaching, when the tip is unworn, to the anterior edge of the peristomium and clearly more than halfway to the mid-dorsal line. The neurocirrus is attached nearly opposite to the notocirrus and is similar in form, though shorter. The setigerous process is bluntly rounded, subhemispherical; it presents a low presetal lip and a long, cirriform, distally tapering postsetal process nearly as long as the neurocirrus, but proximally more slender. In succeeding parapodia, apparently to the last, the notocirrus continues, but becomes shorter and very much more slender and filamentous. The neurocirri on the second and third parapodia are similar in form to those on the first, but those of the third pair are much smaller. (Plate 47, fig. 7). On the fourth parapodia the neurocirri have abruptly changed to a mere flattened scale and are here and on subsequent somites, therefore, essentially absent as any distinct process. (Plate 47, fig. 8). The postsetal process gradually decreases in size caudad, becoming finally merely a slight conical process and not at all evident as a distinct elevation caudad of the twelfth parapodia.

The first branchiae occur uniformly on the seventeenth parapodia (*i.e.*, somite XVIII), though in one specimen the branchia appeared only on one side (the right). The branchiae seem not to occur in most specimens examined beyond the fifty fifth parapodia and in one ceased at the forty fifth, while in another they were traced to the sixty first. Thus, while the point of beginning is fixed, that of ending is variable. The first branchia, are usually simple, but in fewer cases are bifilamentous or even trifilamentous on one side. (Plate 47, fig. 9). The second branchia in one specimen is undivided on the right side and trifilamentous on the left; in another it is undivided on the right and bifilamentous on the left; and in the type it is bifilamentous on both sides, the branchiae, as in the case of the first ones, clearly exceeding the notocirri. (Plate 47, fig. 10). The third branchiae in the type are trifilamentous, but in two other specimens examined are symmetrically bifilamentous. (Plate 47, fig. 11). The fourth branchiae in the type have four filaments on the left and three on the right, the branching being arborescent; in two other specimens they are simply bifurcate. In the type the fifth branchiae on the left side has three filaments, on the right four, the branching arborescent as usual; in the other specimens each branchia has three filaments. (Plate 48, fig. 1). In the type the sixth branchia on the right side has four branches, the left one missing; a second specimen has four filaments on the left and three on the right. The seventh and eighth branchiae of the left side have three filaments, the right missing; the ninth three on each side, the tenth and eleventh four. (Plate 48, fig. 2). On the left side in the type the twelfth left branchia has two filaments of which one is much more elongate than the right, the thirteenth three, of which the middle one is greatly elongate, and, when laid back against the body passes beyond the middle line of the dorsum. (Plate 48, fig. 3). The fourteenth also three, with the middle one similarly elongated. The eight branchiae following this are mostly similarly trifilamentous. The following ones are almost all unifilamentous with the filament long, reaching or surpassing the middorsal line or, when laid forward, as they seem to be normally, attaining the third and sometimes the fourth preceding somite (Plate 48, fig. 4); caudad these decrease, but in the last detected (fifty fourth somite) they are still decidedly longer than the notopodium.

The acicula in the anterior parapodia are slender, distally reduced to a fine tip and scarcely as thick as the dorsal setae, and more slender than the ventral setae; their tips scarcely protrude. In the posterior region the acicula become stouter and the fine tips protrude as usual. (Plate 47, fig. 6). In the first three pairs of parapodia the dorsal fascia are capillary, slenderly acuminate, finely tipped, and not limbate. The coarser ventral setae in these parapodia are compound, the joint distinct and well toward the tip; in these the tip is bidentate, the apical process or lobe is large and rounded, the subapical very small, acute, and close to the apical lobe; farther proximad there is a slight shoulder as in the preceding species; the membranous guards narrow distally to a slender point and rise much above the upper lobe. (Plate 47, fig. 3). Farther caudad the dorsal setae become longer; they end distally, as usual, in a very fine curved tip; below the tip the setae are bilimbate. (Plate 47, fig. 4). The crochets are two in number; they are stout and have the usual slight double curve distally; they are bidentate, the apical tooth being very small and erect, the other one much larger and stouter, its upper edge nearly straight, its lower convex; the guards rise very slightly above the teeth and have the upper margin straight or slightly incurved, long. (Plate 47, fig. 5). The pectinate setae are strikingly different in form from those of the preceding species; from a delicate fine stalk each very gradually widens distad, the enlarged blade being unusually long and slender, and the setae as a whole somewhat oar-shaped.

The maxillae are thin and mostly transparent, of a weak brownish tinge. Maxillae I have the carriers forming a plate which is broad in proportion to its length; the thickened triangular areas extend to the caudal incision, where their acute apices end in contact; the thin plate caudoectad of this on each side has the general form usual in this group of species, but it does not bulge posteriorly, the lateral edge in front of the widely rounded caudal corner being straight or diverging a little cephalad from the long axis. The blade on each side is proximally very broad; it is abruptly narrowed well distad of its middle, the narrowed fang being shorter than in the preceding species. Maxillae II are long, narrow plates bearing on the right side thirteen acute and more or less retrorse teeth, the most caudal of which is nearly at the caudal end; on the left side the inner plate bears twelve teeth, the outer one, which lies close against and parallel with the inner, bearing thirteen teeth. Maxillae III of the left side bears eight teeth (or nine counting an obscure prominence at the proximal end of the series) in a short, very slightly curved row, the right one bearing eleven in a strongly curved row. (Plate 47, fig. 2).

The mandibles in the type have the masticatory plates hard and white, oblique, with the inner ends much prolonged caudad and subacutely pointed; the anterior margin has a single acute incision only, or with trace of a second one. The stems are rather broadly united anteriorly; they are slender and unusually long, and do not narrow caudad until near the caudal ends. (Plate 47, fig. 1).

In the tubes the maximum length noted among those from Sta. 4672 was about 400 mm., the maximum diameter 5 mm., while some tubes were but 3.5 mm. in diameter. The tubes have a tough, though thin, whitish lining membrane outside of which is the thick layer of fine mud, which is greyish brown in color but in part may have a slight greenish tinge. A tube from Sta. 4666 is 455 mm. in length.

LOCALITY. Peru: off Palominos Light House. Sta. 4672 (lat. 13° 11′

S., long. 78° 18′ W.). Depth, 2,845 fms. Bottom of fine dark brown infusorial mud. Bottom temp. 35.2° F. About fifteen tubes, in part with animals *in situ*, were secured 21 November, 1904.

Off Peru: Sta. 4666 (lat. 11° 51′ S., long. 84° 20′ W.). Depth 2,600 fms. Bottom of fine grey radiolarian ooze. Bottom temp. 34.9° F. Two specimens in tubes taken 18 November, 1904.

This species is close in general structure to *O. pachytmema*. It differs clearly, however, in a number of features. It contrasts in its decidedly greenish color, and equally conspicuously in its very much shorter somites. It differs uniformly in having the branchiae begin on the seventeenth parapodia instead of on the sixteenth. The ceratophores of the tentacles lack the narrowing towards both ends from the middle region characteristic of *pachytmema*, these being strictly cylindrical, or with the sides at least not curved longitudinally. The palps are more conical. The carrier-plates of maxillae I are relatively broader, not incurved anteriorly, and have the thickened area extending to the caudal incision instead of only part way, and the narrowed distal fang of the blades relatively shorter. Maxillae II have twelve and thirteen teeth as against ten. The mandibles have the masticatory plates more prolonged caudad along the median line and the stems longer. The pectinate setae differ decidedly in form, the distal blade being very much longer and narrower. The lower prong in the crochets is longer and straighter.

From *O. ehlersi* McIntosh, which it also approaches, it would seem to differ decidedly in general form, being much shorter and broader, its maximum observed length being 86 mm., with a maximum diameter of 3.4 mm., whereas in *ehlersi* the average length is 170 mm. and the width 2.5 mm. The carrier-plates of maxillae I differ in not being narrowed anteriorly and the blades in having a shorter and a more abruptly narrowed distal fang. The teeth of maxillae II are twelve and thirteen instead of ten; and the teeth of maxillae III are eight on the left side and eleven on the right in place of nine on both sides. The pectinate setae have the distal blade clearly relatively longer and more slender. The branchiae would seem to be more strongly developed.

ONUPHIS LEPTA, sp. nov.[1]

Plate **45**, fig. 1–7; Plate **46**, fig. 3–12.

The general color is brown, without definite markings excepting a paler, ventral neural line which is ordinarily traceable over much of the length. The appendages are scarcely paler.

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[1] λεπτὸς, slender.

All the animals were preserved *in situ* in their tubes, th[illegible] portions being, in consequence, soft and in poor condition. They were removed with difficulty, and no animal was secured entire. One specimen in several pieces, but not fully complete, embraced about one hundred and thirty-eight somites; the most anterior piece, consisting of the head and seventy somites and measuring about 70 mm. in length; the somites thus being long. The combined length of the pieces of this specimen is near 150 mm. The greatest width, exclusive of the parapodia, is 2.6 mm. The maximum diameter of the type is 3 mm.

The prostomium is short, cylindrical, rounded distally, and somewhat flattened between the bases of the tentacles. Dorsally there is the usual median longitudinal sulcus from the base of the median tentacle caudad; and ventrally the surface just caudad of the frontal tentacles is concavely depressed. The tentacles are arranged in a circle. The frontal tentacles are small, proportionately stout, subconical, distally rounded processes separated at the base by about half the basal diameter and strongly diverging from each other distad, each projecting ectoventrad. Each dorsal tentacle consists of the usual stout annulate ceratophore and a long, slenderly subulate, smooth style. The ceratophore of the anterior paired tentacles is composed typically of four annuli; the style may be as much as four times as long as the ceratophore, reaching to the fourth somite. The posterior paired tentacles reach to the anterior border of the seventh somite. The ceratophore is from a fourth to nearly a half longer, and is decidedly stouter than that of the anterior pair. It is nearly cylindrical, but thicker distally than proximally, and consists typically of eight annuli, of which the most distal is longest. The style becomes very fine distad and is six times, or somewhat more, longer than the ceratophore. The median tentacle reaches to the third somite, being thus considerably shorter than the anterior laterals, and very much shorter than the posterior laterals. The ceratophore is nearly equal in length to that of the anterior paired tentacles, or it may be a little shorter to considerably longer; but it is much stouter as a rule, though in thickness also varying considerably; it is somewhat narrowed distad, and consists of four articles. The style in the type is nearly four times as long as the ceratophore. The palpi are of moderate size, spherically rounded, and contiguous at the middle line. (Plate 45, fig. 1).

The peristomium is longer and abruptly thicker than the prostomium, and above it rises conspicuously from its anterior to its caudal border. The dorsal surface is smooth. The anterior margin above curves gently forward from the sides to the middle, but there is no normal triangular process at the middle. On each side the border protrudes forward to embrace the sides of the prostomium; the margin of the protrusion is semicircular. From near the anterior border on each side the usual furrow curves ventrad and then more caudoventrad. The lower lip is conspicuously elevated, each of its anterolateral corners being high, free, and rounded; from each of these free corners the anterior margin runs caudad of mesad, as a whole forming a conspicuous obtuse angle, but with the margin a little more depressed at the middle; the surface of the lip is smooth. The tentacular cirri are small, pointed, pale appendages scarcely reaching beyond the caudal edge of the base of the posterior paired tentacle. (Plate 45, fig. 1).

The first metastomial somite continues smoothly the outline of the peristomium above, its depth being thus clearly greater; and it is also much longer than the peristomium. The depth of the immediately succeeding somites decreases gradually and evenly to the sixth and seventh, where the dorsoventral thickness of the body is least. The second metastomial somite is shorter than the first, the third than the second, and the fourth than the third, after which the lengths are gradually increased again. As the somites decrease in height they become less and less strongly arched above, the somites from near the sixth caudad being but slightly convex above and being sharply separated from each other by a distinct line, while the more anterior ones are but vaguely separated dorsally. Ventrally the somites are nearly flat, so that the body over most of its length presents a flattened appearance, the dorsoventral diameter being small in comparison with the width. The first metastomial somite is about five eighths as long as the greatest width across the anterior region; and the fourth two fifths to three fourths as long. At the twenty fifth metastomial somite the length has again increased until it is more than half the width (*e.g.*, *cir.* 11:20). The pygidium was not detected.

The parapodia of the first pair project strongly forward, as usual, the notocirri sometimes extending forward about as far as the tips of the tentacular cirri, or nearly to the posterior level of the lower paired tentacles. The second parapodia extend less forward, the third still less, while the fourth and succeeding ones are essentially transverse. The parapodia of the first three pairs are attached near the anterior edge of their somites and near the ventral level; beginning with the fourth, the parapodia are attached near the middle of the length of the somite and begin to shift gradually dorsad, and with the seventh pair have reached the dorsal level. The notocirrus of the first parapodium is attached near the base about as usual; distad of the short, cylindrical paler cirrophore it expands abruptly, then narrowing gradually to a point. The neurocirrus is attached, as usual, on the ventral surface at the base; it is shorter and more slender than the notocirrus. The low, distally rounded setigerous lobe is not extended in front of the setae, but it is produced into a slender cirriform postsetal process, which is much shorter than the cirri proper, commonly not more than half as long as the notocirrus. (Plate **46**, fig. 3). In succeeding parapodia the notocirrus continues throughout, but caudally becomes much reduced both in length and thickness. The neurocirrus of the second pair is shorter than on the first, and that of the third is still shorter, often appearing as a short, basally stout, conical process; that of the third and succeeding parapodia appears only as a flattened scale merged in a ventral glandular area. The postsetal process becomes quickly reduced caudally but appears as a short subconical process as far back as the seventh, or sometimes the eighth parapodia, caudad of which it is obliterated. (Plate **46**, fig. 3–8).

The branchiae first occur on the sixth parapodiferous segment and continue to the fifty third inclusive. They are in all cases simple, unbranched filaments. (Plate **46**, fig. 9–12).

The ordinary acicula are proximally stout, but distally they are strongly attenuated, the tip being very fine and often sinuously curving. (Plate **45**, fig. 7). In the ordinary somites of the middle and posterior regions there are the usual types of setae. The setae of the more dorsal group are of moderate length, flattened, distally more or less curved, with a fine tip, and distinctly narrowly limbate. The delicate pectinate setae are relatively large; distally they enlarge clavately very gradually, the expanded distal portion being comparatively long and moderately narrow; the distal pectinate end is asymmetrical, rising obliquely from one side to the other, with teeth apparently of uniform length. (Plate **45**, fig. 5). The somite at which the ordinary crochets begin in the type is the eleventh (tenth parapodial). In each parapodium they are usually two in number, but sometimes three occur. They are stout, rather strongly narrowed just below the teeth; bidentate, the inferior tooth large, acute, straight, or with the tip slightly bent downward, and projecting forward about at right angles to the general axis of the crochet; the superior tooth much smaller, acute, and bent forward but little. The membranous guards extend distinctly over and above the inferior tooth, and a little above the upper one; the distal margin of each rises slightly at the caudal end, from there running first nearly straight and then toward the anterior end curving a little downward. The fine fibrillae extend a moderate distance distad. (Plate 45, fig. 3). The compound crochets of the first three parapodia are long and coarse. The distal segment in these is comparatively rather long and distally moderately attenuated bidentate; the superior tooth long, curved forward, narrowly rounded at tip; the inferior tooth small, acute, and straight; no distinct jutting angle or shoulder proximad of teeth; the membranous guard rising high above the level of the superior tooth, slenderly attenuated distad and very acutely pointed. The joint very distinct and the distal piece usually bent at a considerable angle with the proximal. (Plate 45, fig. 4). On the fourth to the ninth parapodia, inclusive, the compound crochets are replaced by simple, stout setae which distally are narrowed to a fine tip, near the base of which the setae are usually bent. (Plate 45, fig. 6).

The maxillae are very thin and semitransparent, pigmented only narrowly along some of the edges, where the pigment is black. The carrier of maxillae I is short and rather broad; it is widest anteriorly, narrowed from in front of the middle, the caudal portion being subtriangular, with the caudally directed apex acutely incised; on each half of the corner there is the usual more elevated triangular area, the caudally directed apex of which lies against that of the opposite one on the median line in front of the caudal incision. The blade narrows evenly and continuously from near the middle distad, the distal half being slender, only slightly curved, continuing evenly the curvature of the proximal portion. Maxilla II of the right side has eleven, mostly somewhat recurved teeth; the inner plate of the left side has eleven teeth, the outer one seven or eight. The right plate of maxillae III is strongly curved and bears a series of ten slenderly acute teeth; the left plate is but slightly curved and bears a series of only six or seven teeth. Each maxilla IV, lying just ectad of the corresponding maxillae III, bears a single acute, dark tooth. (Plate 45, fig. 2). The mandibles are unusually small and are wholly covered. Each masticatory plate diverges from the opposite one in a cephaloectal direction; it is rather slender and distally pointed, with the anterior margin smooth, excepting for a single acute incision nearer the caudal end. The blades are but slightly attached anteriorly; they are very slender.

LOCALITY. Off Panama: Sta. 3392 (lat. 7° 05′ 30″ N., long. 79° 40′ W.). Depth 1,270 fms. Bottom hard. Bottom temp. 36.4° F. A number of tubes containing the animals *in situ* were dredged 10 March, 1891.

This species is characterized by its small size, short median tentacle, bidentate, compound, hooded crochets on the anterior parapodia, and especially by the structure and arrangement of the branchiae, these being all simple and present on parapodia from the sixth to the fifty third inclusive, a large proportion of the somites thus lacking them. Its position with reference to the other Pacific forms having all branchiae simple is shown in the following:

Key.

- *a.* Anterior hooded crochets distinctly dentate and usually distinctly compound.
  - *b.* Anterior crochets tridentate.
    - *c.* Branchiae beginning on the first parapodia.
      - *d.* Eyes present; inner left plate of maxillae II with five teeth, outer with six.
        - *e.* Right maxilla III with ten teeth; upper tooth of compound crochets short, the median tooth extending outward beyond it, the lowermost tooth blunt. .*O. elegans* (Johnson).
        - *ee.* Right maxilla III with seven teeth; upper tooth or fang of compound crochets very long, projecting widely outward beyond the others, the lowermost tooth slender and acute. *O. holobranchiata* Marenzeller.
      - *dd.* Eyes absent; inner left plate of maxillae II with eight or nine teeth, the outer with seven (upper tooth of compound crochets long, projecting beyond the others). *O. iridescens* Johnson.
    - *cc.* Branchiae beginning on the third or on more caudal parapodia.
      - *d.* Branchiae beginning on the third or fourth parapodia and continuing nearly to end of body; fang of compound crochets short, not rounded, not projecting outward beyond the lower ones. . . . .*O. pallida* (Moore).
      - *dd.* Branchiae beginning normally on the fifth parapodia and absent from at least the last forty-four somites; fang of compound crochets much larger and proportionately more slender, distally rounded, projecting beyond the other teeth. .*O. geophiliformis* (Moore).
  - *bb.* Anterior crochets bidentate.
    - *c.* Branchiae beginning cephalad of the tenth parapodia; first parapodia not extending far forward, not or scarcely surpassing the peristomium.
      - *d.* Branchiae beginning on the sixth parapodia, and ceasing at or near the fifty third pair; median tentacle shorter than the posterior paired ones. . . . .*O. lepta,* sp. nov.
      - *dd.* Branchiae beginning on the eighth parapodia and continuing nearly to the caudal end of the body; median tentacle longer than the paired ones. . . .*O. macrobranchiata* (McIntosh).
    - *cc.* Branchiae beginning caudad of the tenth parapodia; first parapodia curved strongly forward, equalling or surpassing the prostomium.
      - *d.* Branchiae beginning on the seventeenth parapodia. . . .*O. pycnobranchiata* (McIntosh).
      - *dd.* Branchiae beginning on the twelfth to fourteenth parapodia.
        - *e.* Branchiae beginning on the twelfth or thirteenth parapodia; somite II between two and three times as long as I; crochets of anterior parapodia simple; diameter near 4.8 mm. *O. hiatidentata* Moore.
        - *ee.* Branchiae beginning on the fourteenth parapodia; somite II five times as long as I; crochets of anterior parapodia distinctly composite; diameter 2 mm. *O. crassisetosa,* sp. nov.
- *aa.* Anterior ventral setae or hooded crochets not dentate, or but vaguely so; simple. Branchiae beginning on thirteenth parapodia. . . . .*O. conchylega* Sars.

ONUPHIS CRASSISETOSA, sp. nov.[1]

Plate **42**, fig. 1–6; Plate **43**, fig. 1–87.

The general color is dark yellow. On the ventral surface over the caudal half of each specimen is a median longitudinal series of paler, whitish spots.

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[1] crassus, coarse, and setosa, with bristles.

The parapodia are paler and the cirri and ventral glandular areas typically white.

The species is represented by two incomplete specimens, each consisting of the anterior portion of the body. One of these is 23 mm. long, with a maximum width of 2 mm., and is composed of thirty-six somites. The other, which is but slightly shorter, consists of thirty-nine somites.

The prostomium is small, proximally subcylindrical, and distally convexly or hemispherically rounded, with the ventral surface more flattened. In anterior view the tentacles are seen to be arranged in a circle. The frontal tentacles are rather small, short, and stout, distally rounded, pale colored processes attached very close together but not quite contiguous. They are much smaller than the palpi. The latter are bluntly conical, well rounded, proximally stout bodies which are very close together and project ventrad from the under surface of the prostomium. The dorsal tentacles have the usual general structure, consisting of a distinct, stout, strongly annulated ceratophore and a long, smooth, distally tapering style; the ceratophores in comparison with those of other species are short. The anterior paired tentacles are short, reaching upon the second somite; the style is nearly three times as long as the ceratophore; the ceratophore consists of two short proximal articles and a smooth distal region equalling about half the total length. The outer posterior paired tentacle intact reaches at present to somite IX, but the tip is broken off and it may have reached at least as far as XI, but judging from its slenderness at the broken end probably not as far as the median tentacle; the ceratophore appears as thick as long and consists of three annuli, of which the most distal is longest. The median tentacle reaches to somite XIII; it is stouter throughout and longer than the posterior laterals; the ceratophore is decidedly stouter than those of the laterals, but it is proportionately short, as thick as long, and consists of four annuli (or of three, the division between the two distal annuli being rather obscure). (Plate **42**, fig. 1).

The peristomium is abruptly much wider than the prostomium, but it is very short, in the middorsal region being only about a third as long as the prostomium. Its anterior margin above is straight or but slightly curved at the middle. Laterally it bulges forward convexly to embrace the prostomium. The entire ventral surface is set off and elevated as the lower lip; this is wholly smooth; its anterior margin is straight, or nearly so, but one specimen shows a small V-shaped incision at the middle line. The tentacular cirri are attached widely apart; each is slender and tapered to a point, and reaches beyond the base of the corresponding posterior tentacle, but does not wholly attain the anterior end of the prostomium. (Plate **42**, fig. 1).

The first three metastomial somites form a region strongly set off from the remaining part of the body by reason of the greater length and the greater height and convexity of these three somites; they also differ in having the parapodia attached at the anterior end and in having them bent more strongly forwards, and they are less sharply separated from each other than are the succeeding ones. The first metastomial somite is five times as long as the peristomium, and across its wider anterior end is not fully twice as wide as long (*cir.* 8:5). The second metastomial has the same length and breadth but appears to be more narrowed caudad. The third metastomial is much shorter (*cir.* 25:17) and is also narrower. The fourth is abruptly much shorter than the third (10:17) and is in the type 3.6–3.8 times wider than long. The succeeding somites increase gradually in width to the tenth or twelfth metastomial and in the type retain nearly the same proportions, but in the paratype are longer after the first five, somites X–XII, etc., being about three times wider than long.

The first parapodia are bent directly forwards along the sides of the peristomium and nearly attain the front margin of the prostomium, which its postsetal process exceeds; the proximal end is thick, conically narrowing to the more slender and cylindrical main portion; the notocirrus is attached near the middle of the dorsal surface, is constricted at base, and as a whole slender and pointed; the neurocirrus is attached on the opposite surface, but at the base it is similar in form and equal in size, or nearly so, to the notocirrus. The distal end of the parapodium presents a prominent, cirrus-like, postsetal process which tapers to a point from a moderately wide base and has its tip nearly on a level with that of the notocirrus where both extend directly distad. (Plate 43, fig. 3). The second parapodia are much shorter than the first and are directed ectocephalad and somewhat ventrad instead of directly cephalad; the cirri and postsetal finger are of essentially the same length and form as in the first. (Plate 43, fig. 4). The third parapodia are again shorter than the second and are directed more ectad; the notocirrus remains equally long and of the same form, and the postsetal process is but little reduced; on the contrary, the neurocirrus has a decidedly different form, appearing as a short, stout, rounded prominence. (Plate 43, fig. 5). In the fourth (Plate 43, fig. 6) and all succeeding parapodia, the neurocirrus is evident only as the usual flattened scale merged in the ventral glandular area. The notocirrus continues well developed on all parapodia to the end of the fragments, but caudad becomes, as usual, much more slender. The postsetal process becomes gradually reduced to a low, pointed process, and finally disappears at about the sixteenth parapodia. The parapodia from the fourth on are attached near the middle of length of somite and are shifted farther dorsad, as usual.

All branchia are simple unbranched filaments which are mostly more or less flattened. The first branchiae detected are on the fourteenth parapodia in both specimens; they are shorter than the notocirri, are a little tapered distad, but with the distal end not acutely pointed. Branchiae of similar form continue to be present on all the following parapodia to the end. They may become, in some cases, a little longer than the cirri, but in no case exceed half the distance to the middorsal line, usually falling distinctly short of half the distance. (Plate 43, fig. 7).

The ventral acicula are moderately stout structures, the exposed distal portion of which terminate in a fine, short, curving tip. (Plate 42, fig. 6). The setae of the dorsal group are long. For most of their length they are straight and capillary, but toward the distal end each is bent. On each side in the region of the bend broadened by two distinct limbi or wings and distally narrowed to a long fine tip. (Plate 42, fig. 5). There is a ventral group of similar limbate setae on all but the anterior parapodia. The ordinary crochets, two in number in each parapodium, are long and much exposed, and of uniform width over most of their length; at the distal end bidentate, both teeth bent out at right angles to the general axis and the distal one the smaller; membranous guard slightly exceeding the teeth, the distal edge straight and rising obliquely from near the lower tooth to above the upper one; strongly fibrillate distad to the cervix. (Plate 43, fig. 2). The pectinate setae are short, delicate, and transparent; the expanded distal end is rolled in the form of a hollow cone, with a sector of about one third missing. The distal margin fringed and the ends each angularly extended mesad into a characteristic triangular flap. (Plate 43, fig. 1). The crochets of the first parapodia are of about the same proportions as those of the other regions of the body, but they present a strong joint and the teeth are of different shape and proportions, the distal one being much the larger, the subapical one much reduced; the joint is very oblique and situated well distad. (Plate 42, fig. 4). On the fourth foot the compound crochets have been replaced by simple ones, one to each parapodium, in which the teeth are of somewhat intermediate character. The dorsal setae in the anterior parapodia are strongly limbate and bent, as elsewhere, but are apparently shorter.

The maxillae are thin and translucent, darkened along some of the edges and over the distal part of the fang of maxilla I. Maxillae I with the carrier-plate equal in length and breadth; on each side incurved at the anterior end and then convexly rounded caudad as usual; each half obliquely bent so as to leave an anterior triangular area more elevated. The blade is short, broad proximally, and rather abruptly narrowed at the middle to the fang, which is neither long nor strongly curved. Right maxilla II with nine stout, blackish teeth, of which the most anterior is decidedly largest; the left outer plate with seven teeth, of which the anterior one is enormous in comparison with the others, appearing somewhat like the blade of maxilla I but proportionately much broader; the inner plate has eight teeth which are stout and darkened, regular, the most anterior not being larger than usual. The right maxilla III is a long, strongly curved plate bearing twelve teeth; the right plate is considerably shorter but is also strongly bent and bears ten teeth. Each maxilla IV is darkened and elevated in a somewhat dentiform process at its anteromesal angle. (Plate 42, fig. 3). The mandibles are well developed, with the masticatory plates visible when *in situ*. These plates are large, hard, white, and strongly diverging, the anterior margin of each incised and dentate near its middle. The stems are narrowed caudad and are scarcely united anteriorly; they are conspicuously darkened. (Plate 42, fig. 2).

LOCALITIES. Off Central America: Sta. 4621 (lat. 6° 36′ N., long. 81° 45′ W.). Depth 581 fms. Bottom of green sand. Bottom temp. 40.5° F. 21 October, 1904. Two specimens in tubes.

Off Galapagos Islands: Sta. 3401 (lat. 0° 59′ 0″ S., long. 88° 58′ 30″ W.). Depth 395 fms. Bottom globigerina ooze. Bottom temp. 43.8° F. One incomplete specimen with hyaline tube attached to silicious sponge rod as in those from the preceding station, 28 March, 1891.

From most other Pacific forms with simple branchiae and the anterior crochets only bidentate, this species is most easily distinguished in having the branchiae begin on the fourteenth parapodia, instead of the sixth in *lepta*, eighth in *macrobranchiata*, seventeenth in *pycnobranchiata*, and twelfth or thirteenth in *hiatidentata*. In the case of *hiatidentata* the relationship is undoubtedly very close, as shown in structure throughout; but numerous differences in details render the separation of the two forms necessary, especially in view of the fact that specimens of the present species from two well-separated stations show constancy in these differences. The present species is very much smaller, having a maximum diameter of only 2 mm., instead of 4.8 mm. in *hiatidentata*. At the same time the dorsum in general is less strongly arched, and is narrowed at the anterior end in the more usual way instead of being specially stout. The palpi are shorter and not at all bilobed. The lower lip is not bilobate. The peristomium is much shorter in comparison with somite II. The somites in general are distinctly longer in proportion, somite V being only from three to three and four fifths times wider than long as against six times wider in *hiatidentata*. The branchiae begin on the fourteenth parapodia instead of on the thirteenth (or twelfth), and the first ones are shorter than the notocirri instead of equalling them. The crochets of the anterior parapodia are conspicuously different so far as Moore's account of *hiatidentata* shows, for they are distinctly compound and the superior tooth is much more elongate. Two crochets appear in each parapodium beginning with X in this species, but not until XV in *hiatidentata*. The pectinate setae differ in the presence of the conspicuous angular flaps at the distal corners.

ONUPHIS COBRA, sp. nov.[1]

Plate **52**, fig. 1–8.

The general color is a dark dusky brown, with the appendages somewhat paler. On the ventral surface the glandular areas along each side are pale, as usual, as are also a number of infraganglionic spots along the midventral line.

None of the type-specimens is wholly complete, though both anterior and posterior ends are present. In the two fragments representing the paratype there are thirty-one (anterior) and thirty-nine (posterior) somites respectively, the two fragments in length measuring respectively 27 and 21 mm. The greatest width, exclusive of the parapodia, is 4 mm.

The prostomium is broad and well exposed, the tentacles being all distinctly removed from the edge of the peristomium. Anteriorly it bears the two cushion-like palpi, which are longest dorsoventrally, thickest at the ventral end, and well separated from each other. The frontal tentacles are very low and rounded, inconspicuous, and scarcely separated at the middle. Between the furrow separating off the frontal tentacles above and the bases of the dorsal tentacles the prostomium is somewhat complanate. The dorsal tentacles are arranged somewhat in a semicircle, the median being farther caudad, from this each posterior lateral being well separated by about the diameter of the ceratophore. Each anterior lateral tentacle is inserted much nearer to the posterior lateral than the latter is from the median, and is but little ectad or directly cephalad of it, being attached at the cephaloectal border of the peristomium. The ceratophores are distinct and but rather weakly annulate, three or four annuli being present. The styles are as thick at base as the ceratophores and gradually taper to the distal end; they are wholly smooth and unjointed. Each tentacle of the anterior pair reaches the second somite. Each of the posterior paired tentacles reaches the tenth somite, or near that, the exact point being in doubt because of the difficulty of uncoiling the style. The ceratophore of the median tentacle is longer and stouter than those of the laterals; the style reaches the twelfth or thirteenth somite.

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[1] Portuguese for Cobra de capello.

The peristomium is short, being but little more than half the length of the prostomium, and only about a third as long as the second somite. The anterior margin above is nearly straight. On each side it curves moderately broadly forwards and is slightly notched at a point from which a wide furrow extends caudad. The lower lip is triangular, with the apex caudad, and is much wider than high; it is set off on each side by a deep furrow extending from the anterior border on each side caudomesad; the anterior margin is nearly straight, with a slight notch at the middle, from which a weak median longitudinal furrow extends to the caudal end. The surface above is smooth. The tentacular cirri are attached caudad of the anterior margin but in front of middle of length, each in line with the corresponding posterior paired tentacle; each cirrus is very slender and tapered and is long, extending beyond the attachment of the other cirri, or forward to a little beyond the anterior margin of the prostomium.

The first metastomial somite is wider and much longer (*cir.* three times) than the peristomium and is, as usual, widest across the anterior end, where it is a little less than two and a half times as wide as long. The second metastomial somite is about three fourths as long as the first, and is three times wider than long. The third is somewhat shorter than the second, while the fourth and succeeding ones are abruptly decidedly shorter than the third, the first three metastomials and the prostomium being set off more or less as a distinct region of the body. The somites increase in width to the tenth or twelfth, in which the width is almost five times the length. The succeeding few somites decrease rather rapidly in width, and thereafter the body remains nearly of uniform width to the caudal region, in which a more rapid decrease again occurs. Dorsally the somites are well arched and ventrally flattened. The anus is distinctly dorsal in position; it is surrounded with a broad elevated rim crossed by numerous deep radial furrows. Below the anus are attached two long, smooth, and slender anal cirri which, when drawn forward, reach almost to the tenth or twelfth somite from the anal end.

The first parapodia occupy the usual position at the anterior border of the second somite, from which they extend forward a little ectad of cephalad along the sides of the peristomium, which they surpass, though, excepting the processes, falling decidedly short of reaching the anterior margin of the prostomium. They are very deep dorsoventrally, being somewhat compressed transversely. The notocirrus is a tapered process of the ordinary form attached on the dorsal surface near the middle of the length and extending distad nearly to the anterior margin of the prostomium. The neurocirrus is attached at the base on the ventral side; it is swollen proximally, above this narrowing rapidly to a more slender process; it appears in the type to fall short of reaching the distal end of the foot. The postsetal process appears to have been worn off, but was apparently broad and distally rather blunt. The second parapodia are similarly attached to the first, but they are much shorter and extend more ectad of cephalad. The notocirrus is attached nearer the base; it is a conspicuously tapered and long process extending about two thirds the distance to the middorsal line. The neurocirrus is short, strongly swollen at base, and conical in form. The third parapodia extend in a still more ectal direction and are attached near the middle of somite; like the second they are cylindrical, and distally subconically narrowed and rounded. The notocirrus is like that of the second pair. The neurocirrus is in the form of a swollen, rounded cushion. The postsetal process is apparently broken off in both specimens. The fourth parapodia extend almost directly ectad, and are attached at the middle of the somite and farther dorsad than the first three pairs, which are near the ventral level; the parapodium as a whole narrows distad from the base and is well rounded at the end. The notocirrus is similar to the preceding ones, but is a little longer. The neurocirrus has become disc-like and merged in the ventral glandular area. The postsetal process is a conspicuously elongate, cirrus-like finger tapering to the free end. The fifth parapodia are attached near the dorsal level. Their general structure is like that of the fourth. Succeeding parapodia maintain the same general structure. But the notocirri become much more slender, in the posterior region being long and almost thread-like. The postsetal process continues to be evident on many parapodia, but at the twenty second has become reduced to a much shorter, pointed process; the precise point at which it ceases to be evident could not be determined.

The setae in general are light brown, or somewhat ferruginous in color, are coarse, long, and over much of the body overlap those of each succeeding somite. On the first parapodia there are three long, stout, distally conspicuously curved setae. These are, apparently, unjointed hooded crochets of the bidentate type. The apical tooth is long, stout, and distally curved caudad; the subapical tooth is very small and extends directly caudad. (Plate **52**, fig. 8). On the second parapodia long capillary setae of the type occurring on the more typical parapodia make their appearance. The ordinary crochets first occur singly, on the eighth somite in the paratype and at least as early as the tenth in the type and probably similarly on the eighth. Farther caudad two crochets appear in place of the one, the first somite on which the two were noted being the nineteenth, though they may occur earlier, the rubbed condition of the specimens preventing entire certainty. (Plate **52**, fig. 7). The acicula have the usual general form. Just after its emergence each is abruptly reduced to a fine, acute tip. The medulla is strongly fibrillate distad to the exposed pale portion. (Plate **52**, fig. 4). The form of limbate setae is shown (Plate **52**, fig. 5) and that of the delicate pectinate setae in figure 6 of the same plate.

In a typical parapodium of the middle or posterior region, each of the two crochets are very long and of uniform diameter nearly to the region of the constricted cervix, just below which it is curved, being elsewhere straight. Distally it is bidentate, the teeth being long and acute; the subapical tooth is stouter than the apical, and lacks an abrupt bend evident in the latter. The membranous guards rise well above the level of the apical tooth and narrow to a point distally. The medulla is strongly fibrillate distad as far as the cervix, and a few short separate fibrillae are evident in the base of each tooth. The dorsal and ventral limbate setae are similar in structure. Each presents a long, straight, strictly capillary shaft and a short, abruptly bent, or geniculate, distal portion which is bilimbate and attenuated to a fine acute tip; the medulla is very finely fibrillate and the wings are obliquely striate, as usual. The pectinate setae are rather numerous, forming a conspicuous dorsal fascicle. They are delicate and transparent, and usually average about half the length of the exposed part of a crochet. The distal expanded portion flares rather strongly, the distoectal corner being prolonged and often curved back mesad. The teeth along the free margin are short and uniform.

The branchiae occur first on somite XV, each as a simple filament which is very short, its length being more than once but less than twice the proximal diameter of the dorsal cirrus. All the remaining branchiae are also simple and cirrus-like, distinctly flattened. The second branchiae are broader than the first and fully twice as long, equalling half the length of the notocirrus, from the base of which it springs, and also exceeding the greatest diameter of the latter.

The succeeding branchiae continue of this form and of nearly the same proportions, in no observed case exceeding two thirds the length of the cirrus, in the posterior region decreasing in length and finally becoming almost rudimentary, but continuing to be present very nearly to the last somite.

The maxillae are well chitinized and are in large part dusky. The carriers of maxillae I have a characteristic form, together forming a plate widest across its anterior end and narrowing caudad in subtriangular form, but with a deep median incision from the caudal end; each lateral margin is gently incurved at the middle of its length; an elongate triangular area on the mesocephalic portion of each piece is more elevated and is paler in color. Each blade is narrowed a little in front of the caudal end, then widens again before more strongly narrowing to the slender, gently curved, distal division, or fang. The right piece of the maxillae II bears nine teeth of nearly uniform size, but with the proximal ones broader and more obtuse. The inner plate on the left side has ten teeth, of which the ones at the caudal end of the series are lower and more rounded, appearing like crenations, the most distal tooth not enlarged. The outer left plate of the second maxillae bears also ten teeth which, beginning at the caudal end as low, small crenulations, increase gradually distad; the most distal tooth is much larger than the others and is separated by a wide space. The right maxilla III bears eleven teeth in a well-curved series, the caudal one being low and blunt, and those at the ectodistal end longer and acute; the left plate has nine teeth also in a well-curved series. Each maxilla IV is a subquadrate plate on which the distomesal angle is darkened and somewhat reflexed. (Plate 52, fig. 3). In the mandibles of the types the masticatory plates are all broken; they are hard, white, and foliate, but the exact form cannot be made out. The stems are expanded at the anterior ends as supports for the masticatory plates, from where they narrow caudad; they are long, curve outwards near their middle, and then mesad at the caudal end where they approach each other; they are darkened caudad to about the middle of their length, the posterior half being whitish. (Plate 52, fig. 2).

Neither of the type-specimens is complete, one being represented by two fragments, the other by three, anterior and caudal ends being present in both cases. In the two fragments representing the paratype there are thirty-one (anterior) and thirty-nine (posterior) segments respectively, the fragments in length measuring respectively 27 mm. and 21 mm. The greatest width, exclusive of the parapodia, is 4 mm.

The general color is a dark, dusky brown, the appendages being somewhat paler. On the ventral surface the glandular areas along each side are paler, as usual, as are also a number of infraganglionic spots along the midventral line.

The tubes consist of a thin lining membrane with a thick coat of fine, dark greenish grey mud, in which are numerous Globigerina shells, etc. The longest tube, apparently incomplete, is 22 mm. long and has a maximum external diameter of 8 mm. The smallest tube has a diameter of 5 mm. One tube has attached to it a piece of decaying wood.

Locality. Off Panama: Sta. 3381 (lat. 4° 56′ N., long. 80° 52′ 30″ W.). Depth 1,772 fms. Bottom of green mud. Bottom temp. 35.8° F. 6 March, 1891. Two specimens and several tubes.

This species is close in its general structure to *hiatidentata* Moore and to *crassisetosa,* sp. nov. From both these species it differs in form and proportions and in having the branchiae much shorter, these being always much exceeded by the notocirri, which are unusually large, as if in compensation for the shorter cirri, as well as in having the branchiae all conspicuously flattened. From *hiatidentata* it differs in having the branchiae begin on the fourteenth parapodia instead of on the thirteenth; decidedly in the triangular form of the carrier of maxillae I, and in the number and form of the teeth of the other maxillae. The ceratophores of the tentacles are proportionately more slender. From *crassisetosa* it differs in being decidedly larger, the diameter being 4 mm. as against 2 mm., and in presenting a conspicuously widened region back of the narrow anterior end. The first metastomial somite is decidedly shorter in comparison with the peristomium. In the maxillae the carrier of I differs in being strongly narrowed caudad; the distal tooth of the outer left plate of II is proportionately much smaller, and its teeth number ten instead of but seven, the inner plate being also ten as against eight, while the right plate has eleven as against nine, the teeth differing in form as well. The pectinate setae resemble those of *crassisetosa* in having the reflexed angles at the distal end, but these are smaller and less conspicuous. The setae of the first parapodia differ in being apparently unjointed. The tube of the present species is of mud over a thin lining membrane, whereas in *crassisetosa* the tube is simply hyaline without foreign adherent material.

PARONUPHIS Ehlers.

Mem. M. C. Z., 1887, **15**, p. 67, 73, 78.

PARONUPHIS SOLENOTECTON, sp. nov.[1]

Plate **39**, fig. 3–8; Plate **40**, fig. 1, 2.

This species, so far as indicated by the type-specimens, is decidedly smaller than most species of Diopatra, the maximum length noted being only about 30 mm. The maximum width, exclusive of the parapodia, is 2 mm., and inclusive of the parapodia, 2.25 mm. An incomplete specimen, the length of which cannot be judged, has a maximum width, exclusive of parapodia, of 2.4 mm. No specimen removed from the tube was wholly complete, the thinness of the walls of the posterior somites resulting in easy breaking and disintegration. The number of somites is limited, as nearly as can be judged, being only about forty. Body widest at from the twelfth to the sixteenth somite, from where it narrows conspicuously cephalad and conspicuously, but more gradually, to the caudal region, whence of uniform width to the pygidium, which narrows abruptly to an acute point.

The general color is brown. A pale ventral and dorsal median longitudinal line, of which the dorsal is less distinct and over much of the length may be scarcely or not at all evident; both lines with a tendency to break into separated dots. Parapodia also lighter colored, yellowish. Setae very pale.

Prostomium as viewed from above broadly subtriangular, but with the sides and the apex rounded, the whole sometimes appearing somewhat semicircular. A transverse furrow or constriction, in line with the anterior edges of the anterior lateral tentacles, separates off a subtriangular apical division. There is a transverse furrow caudad of the unpaired tentacle, behind which the prostomium is more elevated as a transverse ring, which is very short mesally. There is also a semicircular furrow just in front of the median tentacle, with its convexity forward. The frontal tentacles are attached on the front margin toward the ventral side, extending cephaloventrad and at the same time diverging strongly from each other. They are short and stout, being mostly only half, or less than half, the length of the prostomium; in outline, elliptic to broadly subconical, with tip rounded. Either slightly removed from each other at base or in actual contact. The anterior paired tentacles are attached a little caudad and ectad of the frontal tentacles on the lateral edge of the prostomium, a little higher than the frontals. They are short, reaching only upon the first parapodiferous somite or to the beginning of the second. Ceratophores about equalling the frontal tentacles in length but more slender, obscurely four-ringed, or nearly smooth; style smooth, gently tapering, tip not fine. Posterior paired tentacles on each side situated a little above lateral edge of prostomium, immediately back of paired tentacle and in contact, or nearly in contact with it. Ceratophore of essentially the same size as those of anterior pair, smooth, or but very obscurely few ringed; style slender, subulate, smooth, reaching to or beyond somite V, its tip in all types examined being broken off. The median tentacle is located caudad of the middle line; its ceratophore is much longer and stouter than those of the paired tentacles; it is similarly nearly smooth, a few annuli being but vaguely indicated; style correspondingly stouter and longer than that of the paired tentacles, reaching to and probably a little beyond somite IX, its extreme tip in all types being broken off. The palpi are thick, fleshy, hemispherical lobes on the ventral side of the anterior portion of prostomium. No eyes detected.

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[1] *σωλέν*, tube, and *τέκτων*, artificer.

Peristomium very short, being but slightly or not at all more than half as long as the prostomium, conspicuously wider anteriorly than the prostomium, the posterior sides of which it embraces; dorsum strongly convex; anterior margin mesally gently convex. The cirri are attached on the anterior margin widely apart; each is pale in color, regularly tapered to tip, and short, clearly shorter than the distance to base of opposite cirrus and also shorter than the prostomium. The lower lip is a large, smooth, and undivided transverse fold.

The next succeeding somite (II) is much longer than the peristomium, being about three times the length of the latter; it widens cephalad, extending out somewhat at the sides to bear the long parapodia. Somite III of the same general form as II, flaring cephalad, but clearly shorter. Somite IV is still shorter, and V is intermediate between IV and the immediately succeeding short somites, which do not differ much in length among themselves. Beginning with about somite XIII the somites again increase conspicuously in length, in the middle and posterior regions being nearly or quite half as long as wide. Pygidium very small, subtriangular in outline. Anus a subdorsal slit, the surface through which it opens oblique.

The first parapodia extend forwards and a little ectoventrad; they are conspicuously long, their anterior ends being about on a level with the anterior tip of the prostomium; proximally thickest, swollen and high above, narrowing distad abruptly beyond the notocirrus to the subcircularly rounded, flattened, presetal lip; the postsetal process rounded at the end and attached farther proximad, and almost reaching distad to the tip of the postsetal lip; the ventral cirrus is attached at base of parapodium; it is a tapering piece of nearly same form and size as the postsetal process or median cirrus; notocirrus more slender than median cirrus, tapering, not reaching to end of postsetal lip. (Plate **39**, fig. 4). The second parapodia are in general similar to the first ones, but are shorter and are directed more ectad; the terminal button or postsetal lip is smaller; the neurocirrus is decidedly more swollen proximally; the notocirrus is longer and, conspicuously beyond the postsetal lip, or tip. (Plate **39**, fig. 5). The third parapodia are abruptly much shorter than the preceding; the presetal lobe is further reduced and is less rounded, distally pointed; the postsetal process, or median cirrus, much exceeds the end of the parapodium; the ventral cirrus is a much thicker, subconical, distally rounded process; the notocirrus much exceeds the tip of the presetal process, but is shorter absolutely, though not relatively, than that of the preceding pair. The fourth pair are much shorter than the third and extend almost directly ectad, their direction making a conspicuous angle with that of the preceding ones; the presetal lobe is further reduced and relatively narrower; the neurocirrus appears as a conspicuous subglobular tubercle, a character maintained on the following parapodia. The succeeding parapodia become gradually shorter and finally appear simply as rounded eminences on which the presetal and postsetal processes have become reduced to mere points, or quite obliterated. Caudad from the fourth parapodia the length of the notocirri for a while remains nearly constant; they then undergo a marked reduction in size and finally disappear at or near the thirty second somite.

Setae of first parapodia few, long, stout; compound, the oblique articulation distinct; setae conspicuously curving near level of and especially above the articulation; terminal tooth short, conspicuously curved; the accessory tooth short, straight, widely separated from the apical one; guards well developed, distally rounded, somewhat obliquely prolonged. (Plate **39**, fig. 8). Acicula of first parapodia slenderly acutely pointed, the tips not much protruding. On the second parapodia there appears a conspicuous fascicle of usually numerous, fine, transparent pectinate setae in a dorsal group, each with the usual slender stalk and clavately expanded, curved end piece with the series of teeth along distal border; these pectinate setae occur also on the succeeding parapodia, as usual. (Plate **40**, fig. 1). On the second parapodia also appear simple setae which are finely pointed, very narrowly limbate, and distally curved. The stouter compound setae occur in a ventral group on the second and also the third parapodia. On the succeeding parapodia the limbate setae become longer and more numerous, with broader limbus, and are arranged in a dorsal and a ventral group, the dorsal being longer than the ventral, and the pectinate setae occurring in conjunction with them. (Plate 39, fig. 7). The stouter, hooked posterior setae occur first on the tenth, eleventh, or twelfth parapodia, one or two on the first on which appearing, and two on each succeeding parapodium. These setae are stout and straight excepting for a weak curvature toward the distal end; the teeth stout, acute, the distal one strongly curved, the lower one straight, oblique, making an acute angle with the first; guards conspicuously developed, transparent, striate, distally ending in a subacute point. (Plate 40, fig. 2).

Maxillae pale excepting more especially the tips of the forceps, across their proximal ends and edges of the supports, which are black. Maxillae I with supports relatively long, each half acutely pointed at caudal end with caudal notch between the two halves, anterorectal angle obliquely truncate, and the caudoectal angle with a much longer oblique truncation, the side between the two oblique faces straight or nearly so; forceps proper tapering distad, the tip slender, bent strongly mesad, the broader proximal end with a laminate extension on mesal side extending to about middle of length. (Plate 39, fig. 6). Maxillae II with right plate, in the specimen dissected, with nine black-tipped teeth which at caudal end are small and close, but cephalad with the spaces larger and conspicuously wide, each tooth long, acute, and somewhat distally curved; the most anterior longer and more strongly hooked; the left inner plate with eight or nine similar teeth, the outer plate with same number, but with the most anterior tooth especially long, and with a much wider space between the succeeding tooth and the third one than between others; a laminate extension opposite this wider interval; the plates anteriorly are bent ectad, as usual. Maxillae III are exceptionally long; the plates from the caudal ends cephalad are convex, with the anterior ends more strongly curved and extending ectad; left plate with ten teeth, right with twelve or thirteen. Maxillae IV with a single black-tipped tooth at corner of mesal end, the plate narrowing ectad and curved somewhat caudad. The mandibles with masticatory plates large and white, each extending cephaloectad and diverging from the other in the usual way; tip prolonged and subacute or often worn and rounded, a notch proximally on ectal side, and a very conspicuous excision on the mesal side, with a well-marked ventral furrow extending caudad from the excision; stem below the expanded portion bearing the masticatory plate slender, nearly uniform in width anteriorly, the caudal ends of the two bending mesad toward each other, the mesal edge of each bulging mesad near middle of length; the two stems firmly united just caudad of the masticatory plates. (Plate **39**, fig. 5).

Numerous tubes are represented in the collection. These are all conspicuously flattened, and are moderately narrowed toward one end. A typical tube is about 40 mm. long and 5 mm. wide at the larger end, the lesser diameter being but 2 mm., or scarcely more. There is the usual thin, but moderately tough, lining membrane densely encrusted with the shells and shell-fragments of various Foraminifera. Of these shells the large discs of Spirillina are especially conspicuous, occur on all the tubes, and range in diameter from 4 mm. down. In addition, shells of Globigerina are abundant, as are also those of Nodosaria. The elongate shells are nearly always arranged either strictly transversely or somewhat obliquely.

LOCALITY. Off Panama: Sta. 3392 (lat. 7° 05′ 30″ N., long. 79° 40′ W.). Depth 1,270 fms. Bottom temp. 36.4° F. Bottom hard. Numerous tubes containing animals. 10 March, 1891.

This form is characterized particularly by the large maxillae III with their large number of teeth (ten to thirteen), exceeding the number on maxillae II (eight to nine), and the presence of pectinate setae in abundance as far forward as the second parapodia, as well as by the detailed structure of the setae, form of the cirri, and other details. The tube in being strongly flattened differs conspicuously from those of *Paradiopatra fragosa* and *P. glutinatrix* described by Ehlers (Mem. M. C. Z., 1887, **15**, p. 75, 76) from off Florida and made the basis of Paradiopatra, the tubes in these two latter species being cylindrical.

HYALINOECIA Malmgren.

Annulata Polychaeta 1867, p. 67.

HYALINOECIA TECTON, sp. nov.[1]

Plate **38**, fig. 4–9; Plate **39**, fig. 1, 2.

The general color of the specimens from Sta. 3424 is light yellow, in some becoming darker in the caudal region. In the caudal region and for a varying distance forward there may be a conspicuous, geminate, discontinuous median longitudinal dorsal stripe of dark red color. The type-specimen, from Sta. 3425, is much darker throughout; the dorsum anteriorly is a dark brown; but in the middle and caudal regions this darker color becomes denser and restricted to two longitudinal bands, leaving a pale band on each side and a wider median pale band embracing the geminate, interrupted, median stripe. The venter is brown anteriorly, becoming denser caudad, with a narrow pale stripe along bases of the parapodia over the glandular areas, the parapodia themselves being also paler.

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[1] τέκτων, an artificer or craftsman.

The body above is evenly convex, caudally becoming more depressed and with a distinct shallow and wide furrow along each side just within the parapodia, and a weaker depression along the middorsal ridge. The venter is less convex, and has a distinct median longitudinal furrow which deepens caudad. The body is deepest a little in front of the middle and becomes conspicuously thinner, flattened, from there toward the ends. The maximum width is attained near the middle and varies but little from there caudad except at the very end, though some specimens increase in width to near the caudal end. A specimen 68 mm. long has a maximum width, exclusive of parapodia, of about 8.2 mm. and a maximum depth of 6.6 mm. The largest specimen from Sta. 3424 is 75 mm. long. The type is 75 mm. long, with a maximum width of about 8 mm. It is more strongly flattened caudally and less so anteriorly than above noted. Number of somites seventy-six to ninety.

Prostomium somewhat trapezoidal, but with the angles rounded. Anterior margin convexly rounded and the caudal margin widely convex; the sides straight. The median and both pairs of lateral tentacles situated on the posterior half of the prostomium, the anterior laterals being attached at the edges but little cephalad or directly ectad of the posterior laterals, and with the latter and median tentacle, forming a slightly curved row. In this row the ceratophores decrease in thickness and length from the median to the most ectal on each side; ceratophores rather obscurely ringed, sometimes constricted about the middle so as to give two large and equal rings, with a less evident constriction above and below this, giving two adjacent median rings which are short and two larger terminal ones, or in other cases four more nearly equal annuli may be traced. Median tentacle reaching somite XV, posterior laterals XII, and the much shorter anterior laterals IV. The frontal tentacles very short, considerably less than half the length of the prostomium, subelliptic in outline, more than half as thick as long, strongly divergent and directed somewhat ventrad. Palpi rounded, elevated, strongly rugose.

Peristomium well developed. Seven eighths or more the length of somite II and about two thirds as wide. Lower lip longitudinally rugose.

Somite II, conspicuously larger than I and extending forwards and embracing the sides of the latter, its large parapodia well forward. Subdivided dorsally by a weak transverse furrow, the caudal division the shorter. The next seven to ten somites very gradually decrease, the somites over the middle region remaining nearly equal, short, the ratio of length to width being only about one to ten or eleven. At the caudal end the somites become still shorter.

Parapodia, excepting anterior pairs, not prominent. Parapodia of somite II, as usual, much the largest. These project obliquely ventrocephalad, extending ventrad much below the general ventral surface of the body and forwards to near the level of the anterior end of the prostomium; narrowing distad, tip compressed in an oblique direction and with a conspicuous, slender, finger-like, or cirriform, postsetal process. Notocirrus near middle, this a simple style without differentiated cirrophore and not reaching end of parapodium. Neurocirrus similar to notocirrus but shorter, attached on ventral surface proximad of the middle. The second parapodia (on somite III) are decidedly shorter and less stout than the first, but are still much larger than the following ones. They project conspicuously obliquely cephaloventrad in a direction parallel to the first ones. The notocirrus is longer, passing the tip of the parapodium. The postsetal process is also longer, reaching to the distal end of the setae, in the form of a slenderly triangular, compressed process furrowed along the middle of both surfaces. The neurocirrus is proportionately longer and attains, or very nearly attains, the end of the parapodium. The third parapodia are still shorter and project more horizontally. The notocirrus is longer, exceeding the parapodia and attaining the tips of the seta. The neurocirrus is stouter and shorter, subconical. The postsetal lip is of the same form and size. The fourth parapodia are of essentially the typical form and in the typical position. They are a little shorter and distally blunter than the preceding. In none of the parapodia is there a distinct presetal lip. The postsetal processes remain large and of nearly uniform length back to about the twelfth or fifteenth somite, and then become gradually reduced to slight, pale papillae, in the caudal region being scarcely evident. The neurocirrus is still shorter and more bluntly rounded on the fifth parapodia, on the sixth is abruptly reduced to a slightly elevated broad papilla, and on succeeding ones is further reduced and merged in a low, glandular swelling at base of parapodia, these glandular areas becoming shorter caudad. With the appearance of the branchiae the notocirri become much reduced and project on the outer side of the bases of the branchiae only as very short subulate processes.

The branchiae begin on somite XVIII, XIX, or XX either symmetrically or farther forward on one side than on the other. Thus, on one specimen they appear first on somite XVIII on the right side, and on somite XX on the left. They seem most commonly to appear first on somite XX. They increase in length gradually, and commonly reach a maximum length between somites XL and LX, where their length may equal or slightly exceed the width of the somite. The branchiae are flattened, but narrow and acutely pointed. Each at present shows a shallow longitudinal furrow over the large axial blood-vessel. They occur caudally on all excepting the last two or three somites.

The neuropodial acicula are yellow in color. They are mostly four in number in each parapodium. They are stout, nearly straight, and acutely pointed, the tips projecting freely from the surface. The setae of the first parapodia are simple, stout, distally acuminate and entire, and are evenly and moderately curved, aciculiform. The tips of some are finely acute, those of a second, stouter type, more rounded. They may show a very fine roughening distally in the form of sublongitudinal lines, and some more proximally show annular impressed lines. (Plate 39, fig. 1, 2). These on succeeding parapodia are replaced by simple, much finer setae, each of which ends in a lanceolate limbate blade drawn out to an exceedingly fine tip. The setae are curved at the junction of the slender shaft and the broader blade, while the blade itself is more or less evenly curved in the opposite direction, the fine colorless tip again bending back in the other direction. The limbi are very narrow and are crossed by oblique striae, as usual. (Plate 38, fig. 9). The setae of the ventral group have the blades shorter than those of the dorsal group. (Plate 38, fig. 8). In the middle and posterior regions there appear in each fascicle two, and sometimes three, darker hooked setae or crochets. These are shorter than the limbate setae. Each is moderately curved and narrowed below the teeth. The teeth, which are protected by the usual membranous hood, are stout and subequal, each convex on its ectal edge and straight on its inner, or the upper one a little concave; the two are at a moderate angle to the axis. (Plate 38, fig. 6). Associated with the setae of the dorsal fascicle is a tuft of much shorter, very fine and delicate setae, each of which ends in a clavately expanded plate bent into a half or three fourths hollow cone, like a funnel with a sector removed. The fine distal edge is pectinate, as usual, and the surface often appears roughened with longitudinal lines and with punctae. (Plate 38, fig. 7).

Jaws rather thick, strongly chitinized. Caudal pieces of forceps-jaws, or maxillae I, very broad, the greatest width of the two together clearly exceeding the length, the ratio being about six to five. Each caudal piece or carrier is roughly subtriangular, with the apex caudad, but with the ectal side convex and even, the caudal end narrowly rounded, a median notch caudally between the two pieces. A conspicuous thickening or ridge obliquely from anteroectal corner to near middle of inner edge on each piece. Basal portion of forceps constricted a little above base and widening gently distad, widest at distal end, roughened with two curved ridges on face at proximal end. Distal division stout, rather uniformly tapered, moderately strongly curved. Maxillae II dark, blackish. Left outer plate with twelve or thirteen teeth, the inner with eleven or twelve. Right plate with thirteen or fourteen teeth. Maxillae III with nine teeth (left plate). (Plate 38, fig. 5). Maxillae IV with a single tooth. Mandibles blackish back of the white masticatory plates, the stems becoming pale brown to whitish. Masticatory plates large and oblique. Stems narrowest cephalad of middle, gradually enlarging caudad, at the same time incurving and in contact at the caudal end. The two halves separate. (Plate 38, fig. 4).

Of about a dozen tubes, the largest is nearly 265 mm. long, and 10 mm. in diameter across the larger end in the longer direction, the lesser diameter across this end being 8 mm. At the small end the large diameter is about 6.5 mm., the smaller 5.2 mm. The tubes much resemble those of *H. tubicola*. Each is gently curved and tapered, and has an elliptical cross-section at all parts of its length. The texture is quill-like, rigid, and translucent. The tube is, as usual, thickest over the middle portion, where the number of overlapping layers is greatest, and thinnest and most easily collapsible at the large end, where the most recent layer added projects from within the preceding. The usual annular lines representing the exposed edges of successive layers are well marked throughout the length. In the large tube, of which the measurements are given above, the annuli are mostly from 4.5 to 6 mm. apart.

LOCALITY. Off Mexico: Sta. 3424 (lat. 21° 15′ N., long. 106° 23′ W.). Depth 679 fms. Bottom of grey sand with black specks. Bottom temp. 38° F. About a dozen tubes, half of them containing animals, were dredged 18 April, 1891.

Off Mexico: Sta. 3425 (lat. 21° 19′ N., long. 106° 24′ W.). Depth 680 fms. Bottom of green mud and sand. Bottom temp. 39° F. A single specimen taken 18 April, 1891.

From *H. tubicola* (Müller), apparently so common farther south, this species is distinguished in having the branchiae begin farther forward and in their clearly greater length; in having the peristomium much larger in comparison with somite II; in the different proportions of the tentacles; and in the details of structure of setae and jaws. In the small *H. juvenalis* Moore the branchiae may similarly begin on somite XIX; but, among other differences, that form has conspicuous eyes, whereas the present one has none, and differs in the form and size of postsetal and presetal lips of the parapodia, in the fewer teeth of maxillae III, in the much smaller peristomium, which is only one third as long as somite II, and in the presence of compound setae on the first parapodia.

HYALINOECIA TUBICOLA (O. F. Müller).

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Spio filicornis Delle Chiaje, Mem. anim. regn. Napoli, 1828, **3**, p. 173, 176, pl. 45, fig. 6, 7.

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Northia tubicola Johnston, Cat. annelids Brit. mus., 1865, p. 136, 341; Parfitt, Trans. Dev. assoc., 1867, **2**, p. 20.

Hyalinoecia tubicola Malmgren, Annulata Polychaeta, 1867, p. 67; Kupffer, Jahresb. Comm. deutsch. meere, 1871, p. 150; Sars, Bidrag Christ. fauna, 1873, p. 16; Malmgren, Göteb. vet. vitt. handb., 1874, **14**, p. 85; McIntosh, Ann. nat. hist., 1874, ser. 4, **14**, p. 200; Invert. & fishes St. Andrews, 1875, p. 123; Tauber, Annul. Danic., 1879, p. 103; Langerhans, Zeitschr. wiss. zool., 1879, **33**, p. 241, pl. 15, fig. 26; Marion, Ann. sci. nat., 1879, ser. 6, **8**, p. 17; Schmiedelberg, Mitth. Zool. stat. Neapoli, 1882, **3**, p. 373; Wirén, Chaetop. Vega exped., 1883, p. 403; Levinsen, Vidensch. meddel. fores. Kjöben., 1883, p. 227; McIntosh, Challenger Annelida, 1885, p. 335; Carus, Fauna Meditt., 1885, **1**, p. 209; Pruvat, Arch. zool. expér., 1885, ser. 2, **3**, p. 256, pl. 13, fig. 1–5; St. Joseph, Ann. sci. nat., 1898, ser. 5, **5**, p. 241; McIntosh, Ann. mag. nat. hist., 1903, ser. 7, **11**, p. 557; **12**, p. 164; Moore, Proc. Acad. nat. sci. Philad., 1904, p. 144; Augener, Bull. M. C. Z., 1906, **43**, p. 135; St. Joseph, Ann. sci. nat., 1906, ser. 9, **3**, p. 199, pl. 4, fig. 75; Eisig, Fauna u. flora Golfes Neapol, 1906, **28**, p. 215; McIntosh, British annelids, 1910, **2**, pt. 2, p. 419, pl. 44, fig. 5–5b, pl. 64, fig. 5, 5b, pl. 65, fig. 15, pl. 75, fig. 11, pl. 84, fig. 8, 8b–8d; Izuka, Journ. Coll. sci. Imper. univ. Tokyo, 1912, **30**, p. 97, pl. 11, fig. 1–4.

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Onuphis gracilis Ehlers, Mem. M. C. Z., 1887, **15**, p. 78; Levinsen, Vidensk. ud. hauchs, 1893, p. 331; Marenzeller, Zool. ergebn., 1893, **2**, p. 9; Roule, Camp. Caudan, 1896, p. 445.

Localities. Peru: off Aguja Point. Sta. 4653 (lat. 5° 47′ S., long. 81° 24′ W.). Depth 536 fms. Bottom of dark brown volcanic mud. Bottom temp. 41.3° F. 12 November, 1904. Numerous specimens.

Off Panama: Sta. 3353 (lat. 7° 06′ 15″ N., long. 80° 34′ W.). Depth 695 fms. Bottom of green mud. Bottom temp. 39° F. 10 March, 1891. A number of specimens of large size.

Off Panama: Sta. 3356 (lat. 7° 09′ 30″ N., long. 81° 08′ 30″ W.). Depth 546 fms. Bottom of soft black mud. Bottom temp. 40.1° F. 23 February, 1891. Seven specimens.

Off Panama: Sta. 3362 (lat. 5° 56′ N., long. 85° 10′ 30″ W.). Depth 1,175 fms. Bottom of green mud, and sand, with rock. Bottom temp. 36.8° F. 20 February, 1891. Fifteen poorly preserved specimens.

Off Panama: Sta. 3366 (lat. 5° 30′ N., long. 86° 45′ W.). Depth 1,067 fms. Bottom of yellow Globigerina ooze. Bottom temp. 37° F. 27 February, 1891. Three tubes.

Off Panama: Sta. 3392 (lat. 7° 05′ 30″ N., long. 79° 40′ W.). Depth 1,270 fms. Bottom temp. 36.4° F. Bottom hard. 10 March, 1891. Many tubes of which a considerable proportion contain animals. Tubes of small and intermediate sizes. To some are attached small actinarians, barnacles, and tubes of serpulids.

Off Panama: Sta. 3393 (lat. 7° 15′ N., long. 79° 36′ W.). Depth 1,020 fms. Bottom of green mud. Bottom temp. 36.8° F. 10 March, 1891. A number of tubes of varying size, mostly empty.

Off Galapagos Islands: Sta. 3400 (lat. 0° 36′ N., long. 86° 46′ W.). Depth 1,322 fms. Bottom of light grey Globigerina ooze. Bottom temp. 36.1° F. 27 March, 1891. Several tubes of large size containing badly preserved fragments of animals. The dentate spines of posterior somites appear somewhat more slender and curved, with the terminal teeth at a greater average angle with the axis of the shaft than in the specimens from the shallower depths off Panama.

Off Galapagos Islands: Sta. 3407 (lat. 0° 04′ S., long. 90° 24′ 30″ W.). Depth 885 fms. Bottom of Globigerina ooze. Bottom temp. 37.2° F. Several tubes like those from Sta. 3400. 3 April, 1891.

The above agree with specimens from the Atlantic. There seems to be considerable variation in the direction of the teeth of the stout hooked setae. In the material from off Panama many of these setae have the terminal teeth projecting in the direction of the axis of the shaft instead of at a distinct angle with it, as more usual. This is a characteristic of Moore's *H. tubicola stricta*, dredged from off San Diego, Cal.; but in the present series of specimens this character is variable and is not correlated with a difference in the jaws as given for *stricta*. Many of the specimens have the setae of strictly typical form. In regard to the jaws it may be said that the specimens agree with the typical Atlantic form, the teeth of maxillae II, left outer plate, being mostly thirteen with sixteen as the maximum noted and twelve as the minimum. No individuals showed the high numbers occurring in *stricta*, namely eighteen for the left outer plate II and seventeen for the right.

This species as now known has an exceedingly wide range, having previously been recorded from various parts of the North Atlantic off both the American and European coasts, and from the Mediterranean, Canary Islands, Azores, West Indies, off Brazil, New Zealand, Torres Strait, Japan, East Indies, and Africa.

Hyalinoecia leucacra, sp. nov.[1]

Plate **37**, fig. 9, 10; Plate **38**, fig. 1–3.

Two incomplete specimens are in such poor state of preservation that a complete account cannot be given. This is a slender form having a maximum diameter of about 2 mm., exclusive of the parapodia.

The median and posterior paired tentacles, which are broken off at the tips in one and absent from the other, seem to be of nearly equal size, the anterior paired tentacles being very much shorter. The ceratophores are long and relatively slender, though clearly stouter than the styles. Each is rather weakly annulate, the annuli long.

The peristomium is much shorter and narrower than somite II, its length in the type being less than one half that of the latter somite.

The anterior pairs of parapodia are longer than usual, the first pair in particular being conspicuously so and extending almost directly forwards much beyond the anterior end of the prostomium.

The setae of the first parapodia are very numerous and closely crowded. They are much stouter than those of the posterior somites, dark-colored, aciculiform, curved distally, and at distal end with two blunt lobes or teeth with guards. (Plate **38**, fig. 2). Acicula ending abruptly in very fine, transparent tips equal-

[1] λευκὸς, white, ἄκρα, tip.

ling or a little surpassing the other setae. The acicula of the other parapodia also long and similarly ending in fine tips. Similar but smaller setae occur on the second and following parapodia; but, in addition, limbate setae are present and a fascicle of pectinate setae that have unusually long stalks. The expanded tips of the pectinate setae have the usual cuneate outline, each being like a funnel with a large sector removed, and with the free edge finely pectinate. (Plate **37**, fig. 9). The limbate setae are conspicuously bent at the base of the blade and the very fine tip is more or less curved, frequently hooked to some extent. (Plate **37**, fig. 10). Farther caudad uncinate setae, or crochets, make their appearance. These are long and generally stout though varying considerably in thickness and in the curvature at the cervix. The teeth stand at a considerable angle with the axis, the upper and somewhat larger one stout and considerably curved. (Plate **38**, fig. 1). The setae are all proportionately long. The limbate setae have the blades whitish in color so that the fascicles appear white tipped, giving a characteristic appearance to the species.

In one specimen the maxillae have the teeth whitish. In the left outer plate III there are eleven teeth, on the inner thirteen. The teeth of the inner plate are coarser than those of the outer one. The halves of the mandibles seem to be entirely distinct, being only in weak contact. The white masticatory plates stand at a strong angle to each other, each extending obliquely cephalo-ectad. Each has a distinct notch on the ectal side, the plate being somewhat depressed or furrowed mesad from this. The stems are widest at the anterior end just caudad of the masticatory plate. (Plate **38**, fig. 3).

The somite on which the branchiae begin could not be determined. The longest branchiae about equal the width of the somites.

The tubes have the structure and appearance usual in the genus. The maximum diameter at the large end is about 5.5 mm. The rings representing the limits of successive layers are mostly from four to five millimeters apart.

The color of the animals is very dark excepting a pale median dorsal and a median ventral band. Some of the glandular pads are also pale. The limbate setae white at tips.

LOCALITY. Off Mexico: Sta 3418 (lat. 16° 31′ N., long. 99° 52′ 30″ W.). Depth 660 fms. Bottom of brown sand with black specks. Bottom temp. 39° F. 11 April, 1891. Two specimens.

Characterized especially by the very long first parapodia and their numerous stout setae, and by the structure of the setae of these and the other parapodia.

Entangled in the setae of one of the specimens were a number of vegetable fibres and cells. These were chiefly stellate idioblasts of large size, probably from some decayed terrestrial plant. This is not at all surprising in view of the fact that Mr. Agassiz found terrestrial debris so abundant at all depths in this region. In his letter concerning the explorations of the ALBATROSS in this region he says: "Nearly everywhere except on the face of the Galapagos slope we trawled upon a bottom either muddy or composed of Globigerina ooze, more or less contaminated with terrestrial deposits, and frequently covered with a great amount of decayed vegetable matter. We scarcely made a single haul of the trawl which did not bring up a considerable amount of decayed vegetable matter, and frequently logs, branches, twigs, seeds, leaves, fruits, much as during our first cruise." (Bull. M. C. Z., 1891, **21**, p. 190-191.)

LEPTOECIA, gen. nov.[1]

Prostomium with two short, thick, frontal tentacles and five posterior, or dorsal, tentacles each provided with a ringed ceratophore. A pair of cushion-like palpi separated ventrally by a median fissure.

Peristomium simple and very long, bearing no tentacular cirri.

Body flattened, especially posteriorly; not obviously narrowed cephalad, but at the caudal end narrowed acutely. Anus terminal on pygidium. Anal cirri apparently two.

First parapodia large, extending directly forwards along the sides of the peristomium but not attaining the prostomium. Ending distally in a flattened process and bearing unjointed hooded crochets.

Ventral cirri soon becoming reduced to pads. Dorsal cirri decreasing in size caudad and disappearing in the posterior region.

On the anterior parapodia, excepting the first, occur limbate and delicate pectinate setae, while farther caudad there occur strong hooded crochets and other limbate setae.

Maxillae of the usual number and arrangement, with all parts well developed. Mandibles also well developed, with long shafts and rather narrow, subfoliate, masticatory plates.

Branchiae none.

Tube thin, translucent, without foreign material.

GENOTYPE.— *L. abyssorum*, sp nov.

[1] λεπτὸς thin, and *οἰκία*, house.

This genus seems unquestionably close to Hyalinoecia. From this it differs especially in wholly lacking branchiae, and in the much greater relative length of the peristomium, which the first parapodia do not surpass.

LEPTOECIA ABYSSORUM, sp. nov.[1]

Plate **36**, fig. 1–6; Plate **37**, fig. 1–8.

The general color is dull yellowish. There is a whitish, median ventral, or neural line. The parapodia are a lighter yellow and the tentacles, cirri and ventral glandular areas are pale.

The type is a slender specimen in three fragments which have a total of about seventy somites. The fragments together have a length of about 42 mm. The width does not vary much excepting at the extreme caudal end, where the body narrows to a point. The anterior end is not narrowed. The width in the middle region of the body is 1.75 mm.

The prostomium is narrowed from behind cephalad, being bluntly subconical. Anteroventrally the prostomium presents four lobes, being divided by a median subvertical furrow and again by a transverse furrow. The upper lobes are essentially frontal tentacles; they are low and rounded, subhemispherical, and pale in color. The lower lobes are larger and correspond to the palpi, *e.g.*, in Onuphis. They are large, smooth, thick rounded pads on the ventral side. They are contiguous at the middle line and extend transversely to, or bulge out a little beyond, the lateral borders of the prostomium. The anterior paired tentacles do not reach the caudal end of somite I. The ceratophore is short and but vaguely annulate. The style is proximally as thick as the ceratophore and narrows distad to the free end. The posterior paired tentacles are inserted caudoventrad of the anterior paired ones. They have the distal portion of their styles broken off, so that their length cannot be given. The ceratophore is only indistinctly annulate. The style at base is as thick as or a little thicker than the ceratophore and narrows gradually distad, as usual. The median tentacle is inserted but little caudad of the level of the posterior paired ones from each of which it is farther removed than the latter is from the corresponding anterior paired tentacle. It is removed from the caudal edge of the prostomium by its diameter, or more. Its style is broken off. The ceratophore is vaguely annulate and is thicker than that of the posterior laterals. (Plate **36**, fig. 1, 2).

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[1] abyssus, depth.

The peristomium is decidedly wider than the prostomium and is very much (nearly one and two thirds times) longer. The anterior margin above is straight, or nearly so. Laterally it curves forward and embraces the sides of the prostomium. The lower lip consists of a rather small, more elevated, subtriangular area set off on each side by a depression extending mesocaudad from the anterior margin. Its anterior border protrudes forward and the edge is straight. (Plate 36, fig. 1, 2).

The second somite (first metastomial) consists of a wider anterior division, from which the parapodia arise, and a narrower caudal ring; its total length is about equal to that of the peristomium. The succeeding somites decrease gradually in length to the fifth, which is four fifths as long as the peristomium or as the second somite (first metastomial), the following segments through the middle region running of the same length, or nearly so. In the posterior region they become much shorter, only half as long as the fifth, etc., and in the narrowed caudal division only a third or fourth as long. The somites are dorsally moderately arched, ventrally more nearly flat, the body being compressed dorsoventrally, and in the type mostly strongly so at the caudal end.

The first parapodia are attached laterally at the anterior border and nearer the ventral surface of the somite; they extend directly forwards or but very slightly ectad and close to the side of the peristomium; they are cylindrical and long, attaining, or very nearly attaining, the anterior end of the peristomium. The notocirrus is attached dorsally a little distad of the middle; it is slender, moderately tapering, and short, not extending beyond the distal end of the parapodium. The neurocirrus is attached on the ventral surface farther toward the base; it is slender and short, not extending beyond the beginning of the distal third of the parapodium. The parapodium at the distal end presents only a slight presetal elevation; but caudad of the setae there is a prominent, wide, distally widely rounded or subtruncate, postsetal lobe. (Plate 37, fig. 1). The second parapodia are abruptly very different; they are similarly attached at the anterior end but extend more ectad and are very much shorter. Their notocirrus is of a similar form and size but is attached proportionately decidedly farther proximad. The neurocirrus is attached at the very base and is proximally stouter than that of the first parapodia. The postsetal process is more slender, strictly cirriform, and is much longer than in the first foot. (Plate 37, fig. 2). The third parapodia are attached in the same manner as the second ones, have a similar direction, and are of essentially the same size. The notocirrus and the postsetal process are the same in form, size, and position; but the neurocirrus is reduced to a low rounded elevation or tubercle. (Plate 37, fig. 3). On succeeding parapodia caudad the notocirri gradually become reduced both in length and diameter, finally in the posterior region appearing as mere rudiments or tentacles, and then quite disappearing. (Plate 37, fig. 4). The neurocirrus is reduced to a scale-like body in the glandular area, as usual in Onuphis. The postsetal process caudally becomes gradually reduced, appearing soon as a merely slight, rounded, elevation, and not at all evident after the thirteenth parapodia or near them. The parapodia after the third become attached near the middle of the somite and shift to a more dorsal position, as usual. Through the middle region they continue as moderately prominent processes, but in the posterior region they become more shortened. Throughout the length the parapodia continue to project in a distinctly ectocephalic direction.

The ordinary crochets, occurring on all but the more anterior somites, are long, coarse, transparent setae, which are straight except toward the distal end, where they are gently curved; they are of essentially uniform diameter until narrowed in the usual way below the cervix, or they may appear a little thicker just below this region; the medulla is finely, obliquely fibrillate in the distal portion; they are bidentate, the teeth oblique and subparallel, rather slender and acute, with the subapical one the longer; the membranous guards rise conspicuously above the apical tooth and are narrowly, subacutely rounded at the tip. (Plate 37, fig. 7). The delicate pectinate setae are numerous and form a prominent fascicle, more dorsal in position; the stalks are comparatively long, and the end-piece is cuneate in outline, but forms really a hollow half cone, with a fringe of uniform and rather short teeth along the distal edge. (Plate 37, fig. 5). Below the fascicle of pectinate setae is a series typically of four long, stout, limbate setae; each of these is typically moderately bent near the beginning of the distal third, which is acuminate and ends in a fine tip; the seta is bilimbate, the wings widest at the bend, and from there they narrow each way and so soon disappear. (Plate 36, fig. 5, 6). The acicula are pale; they are stouter than the coarse limbate setae and most of the buried portion is of nearly uniform thickness; a little below the surface each aciculum begins to narrow, and above the surface is rapidly attenuated to a fine tip. (Plate 37, fig. 6). On each of the first parapodia there are three stout setae or crochets of special character; these are weakly and moderately curved, are unjointed, and are apparently rounded, with but a slight indication of a tooth set off by an incision below tip; each tip is protected by two membranous guards that rise above its apex, the guards narrowing abruptly at level of tip of seta, which it enfolds proximally; the medulla is densely fibrillate, the fibrillae being somewhat oblique and usually very dense excepting in the distal region. (Plate **37**, fig. 8). No crochets of this type are found in the type on the second parapodia, but in their place occur stout setae gradually attenuated distad to a fine flexible tip and narrowly limbate along one side, these on other parapodia caudad occurring among the shorter of the usual bilimbate setae.

The maxillae are thin and translucent, with the edges and the tips of the first pair dark. Maxillae I have the carriers usually united along the middle line to form a plate longer than wide; the plate on each side toward the anterior end is weakly incurved and commonly moderately bulging, caudad; the plate is uniform in the type, the elevated triangular area being set off anteriorly only vaguely; the blades are of the usual falcate form, the terminal portion slender and well curved. Maxilla II of the right side has twelve teeth which gradually increase in size distad, the most distal being conspicuously large and well separated; the inner plate on the left side has thirteen teeth also increasing in size distad, and the outer plate has eighteen teeth, of which the most distal one is abruptly decidedly longer and stouter. Maxilla III of the left side has eleven teeth, that of the right side has ten teeth. (Plate **36**, fig. 3). The mandibles are of good size but are thin and translucent. The masticatory plates are narrow mesally and subclavately enlarged ectad; they are white and hard; below the ectal end of each is a conspicuous notch separating it from the expanded supporting part of the stem. The anterior edge of each plate is nearly smooth, but slightly uneven, the two meeting at an angle of less than 90°. The stems are long and, excepting at the ends, are parallel and of uniform width; they are weakly united anteriorly and are pale throughout, excepting for a short but conspicuous narrow black stripe on each along its mesal edge at the anterior end. (Plate **36**, fig. 4).

The tube is straight, flexible, and transparent. It presents on each side a slender, rather stiff, cylindrical, supporting rod. The membrane between the two rods is thin and transparent. The tube is flattened at right angles to the plane embracing the axes of the two supporting rods, its cross-section being somewhat lenticular. The transverse diameter is 3.2 mm.

LOCALITY. Between the Galapagos and Peru: Sta. 4647 (lat. 4° 33′ S., long. 87° 07′ 30″ W.). Depth 2,005 fms. Bottom of light grey and brown Globigerina ooze. Bottom temp. 35.4° F. 9 November, 1904. One specimen.

LUMBRINEREIDAE.

In this family the body is more or less elongate and cylindrical, ordinarily narrowed anteriorly but more strongly so posteriorly; distinctly segmented. The skin is of tough consistence and is smooth and strongly iridescent.

The prostomium is most commonly conical, or sometimes more rounded. Both tentacles and palpi are most commonly absent, or three tentacles may be present in the Lysaretinae. Eyes present or absent.

First two somites without appendages and smooth, or the second sometimes setigerous. Mouth commonly having two lips.

Parapodia uniramous, well developed. No ventral cirri are present, while the dorsal cirri are either foliaceous in character or rudimentary. Branchiae only rarely present (Ninoe).

The setae may be of various types. In some all the setae are of a simple, capillary, laminate type, while in other cases crochets, or crochets and composite setae are present.

The proboscis is armed with a pair of mandibles, or these may be obsolete, and with a definite and commonly, but not always, even number of maxillae.

Both anterior and posterior regions may be regenerated in some forms at least (Lumbrinereis, Halla).

The lumbrinereids occur in mud and sand and under stones in the littoral zone, as well as down to depths exceeding two thousand fathoms, as in the case of *Lumbrinereis abyssorum* secured by the CHALLENGER off the west coast of South America at a depth of 2,225 fathoms. Many have been taken from the stomachs of fish.

The species of certain genera are normally commensals or parasites during all or the early part of their lives. *Labrostratus parasiticus* was found by St. Joseph (Ann. sci. nat., 1888, ser. 8, **5**, p. 219, 221) occurring in the general body-cavity of various syllids, such as *Odontosyllis ctenosoma*, *Eusyllis monilicornis*, *Pionosyllis lamelligera*, *Syllis prolifera*, and *Grubea clavata*. In this species the adults may be free and non-commensal. *Oligognathus bonelliae* Spengel occurs in the body cavity of the gephyrean Bonellia (Spengel, Mitth. Zool. stat. Neapel, 1882, **3**, p. 15, pl. 2–4). *Haematocleptes terebellidis* Wirén seems to live a completely parasitic life in the blood sinus of the wall of the stomach of *Terebellides strömi* (Bih. K. Svenska vet. akad. Handl., 1886, **11**, no. 12). This form shows a strong reduction of the maxillary apparatus, an atrophy also evident, but less marked, in Labrostratus. *Labidognothus parasiticus* Caullery (Compt.

rendus Soc. biol., 1914, **77**, p. 490) also lives parasitically in a terebellid, but the regressive modifications are much less pronounced. *Ophiuricola cynips*, described by Ludwig (Zool. anz., 1905, **29**, p. 397) as parasitic and galligenous in swellings on the arms of the deep-sea *Ophiura tumulosa* (Lütken and Mortensen) is too briefly characterized to make it possible definitely to place it, though it may be a lumbrinereid.

Key to Genera.

a. Dorsal cirrus rudimentary...*Lumbrinereinae.*
b. Parasitic forms; jaws more or less atrophied.
c. Eyes none (parasitic in Terebellides)..........................*Haematocleptes* Wirén.
d. Setae not emerging from parapodia; maxillae I strongly atrophied.
dd. Setae emerging freely from parapodia, two series of fascicles; maxillae I well developed. *Labidognathus* Caullery.
cc. Four eyes present.
d. Lower jaws moderately developed (parasitic in Syllidae)......*Labrostratus* St. Joseph.
dd. Lower jaws more atrophied (parasitic in Bonellia)...............*Oligognathus* Spengel.
bb. Not parasitic; jaws normally developed (excepting in Biborin).
c. With only simple, mostly capillary and laminate setae, no hooked spines or crochets.
d. First two somites achaetous.
e. With no maxillae...*Biborin* Chamberlin.
ee. Maxillae well developed.
f. Blades of maxillae I in form of stout hooks which may be mesally denticulate only at base.
g. Third and fourth maxillae reduced to hooks.
h. Maxillae I with three slender supports......................*Loranda* Kinberg.
hh. Maxillae I with but two supports......................*Drilonereis* Claparède.
gg. Third and fourth maxillae dentate plates, not reduced..........*Arabella* Grube.
ff. Maxillae I not in the form of hooks or strongly uncate plates; normally dentate along entire mesal edge.
g. With four pairs of maxillae...............................*Pterothrix*, gen. nov.[1]
gg. With five pairs of maxillae.
h. Small notocirri present; setae few, dentate at base of limbus..*Notocirrus* Schmarda.
hh. No notocirri obvious; setae simply limbate, not dentate....*Notopsilus* Ehlers.
dd. First somite only achaetous; five pairs of jaws......................*Aracoda* Schmarda.
cc. Crochets or compound setae or both present, more than one in most parapodia of posterior region.
d. With digitate branchiae on setigerous lobes of parapodia...............*Ninoe* Kinberg.
dd. No branchiae.
e. Crochets single, sometimes aciculiform but always hooded.
f. First maxillae in form of strong hooks; III and IV not dentate..*Cenogenus*, gen. nov.
ff. First maxillae not in form of hooks, strongly dentate, with long posterior supports. Guards of crochets strongly asymmetrical....................*Cenothrix*, gen. nov.
ee. Crochets not single.
f. With four pairs of maxillae.
Maxillae I in form of stout hooks; crochets numerous in posterior region. *Lumbrinereis* Blainville.
ff. With five pairs of maxillae....................................*Larymna* Kinberg.
aa. Dorsal cirri well developed, usually foliaceous.................................*Lysaretinae.*
b. Prostomium anteriorly with two laterally directed processes............*Enonella* Stimpson.
bb. Prostomium with no such anterior processes.
c. Carriers of maxillae I short, forming broad blades...................*Lysarete* Kinberg.
cc. Carriers of maxillae I long and filiform.

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[1] Genotype, *Notocirrus scoticus* McIntosh.

d. With two complete somites apodous.
Two eyes and five pairs of maxillae .... *Halla* A. Costa.
dd. With one complete somite apodous, a second incomplete somite may be evident ventrally.
e. With six pairs of maxillae .... *Danymene* Kinberg.
ee. With five pairs of maxillae .... *Oenone* Savigny.

The key follows the general lines indicated in Grube's revision (Jahresb. Schles. gesellsch., 1879, **56**, p. 78), but with such differences as further knowledge has rendered necessary. There is considerable uncertainty with reference to some genera that have been proposed, and some here suppressed may be found to have differential generic characters not evident in the published accounts, while others may have to be abolished.

Synonymy of Genera.

The genus Enonella, founded by Stimpson (Invertb. Grand Manan, 1853, p. 34, f. 25, 25 a–d) for a species (*bicarinata*) found at Grand Manan is far too incompletely described to be placed with certainty. It appears to belong in this group. It is readily distinguished from other lumbrinereids by the form of the prostomium with its two laterally directed processes in front.

Lais Kinberg (1865), being preoccupied in Acaridea, was replaced by Ehlers with Notopsilus (1868).

As the type-species, *fulgida* Savigny, of Aglaura Savigny (1820), which, being preoccupied, was later replaced by Aglaurides Ehlers (1868), has now been shown to be the same as *lucida* Savigny, the type of Oenone, the first name and its substitute lapses. There is ground for thinking that *fonensis* Kinberg may also be the same as *lucida,* in which case Danymene will also lapse. It is kept apart at present on the basis of the supposed difference in the number of maxillae.

Cirrobranchia Ehlers is in synonomy with Halla A. Costa, as is also Plioceras of Quatrefages.

Maclovia Grube is merged with Arabella Grube.

Zygolobus Grube (written Zygophyllus in the description of plates) is included in Larymna Kinberg.

Bidenkap (Kgl. Norsk. vid. selsk. Skr., 1907, 1906, no. 10, p. 16) has established the Unciniseticlae for his genus Unciniseta characterized by having biramous parapodia bearing only crochets and lacking cirri. It is apparently near the Lumbrinereidae and Dorvilleidae; but, unfortunately, the character of the proboscis in the type and only known species, *U. swenanderi* Bid., is not indicated.

LUMBRINEREIS Blainville.

Dict. sci. nat., 1828, **57**, p. 486.
Scoletoma BLAINVILLE, *ibid.*, p. 492.
Lumbriconereis GRUBE, Archiv. naturges., 1851, **17**, p. 45.
Eranno Kinberg, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 567.

LUMBRINEREIS BIFILARIS Ehlers.

Plate **60**, fig. 6–9; Plate **61**, fig. 1.

Lumbriconereis bifilaris EHLERS, Abhandl. K. gesellsch. wiss. Göttingen. Math. phys. klasse, 1901, p. 139, pl. 18, fig. 1–10; MOORE, Proc. Acad. nat. sci. Philad., 1911, p. 291.

In a specimen from Sta. 3418 there are 135 segments exclusive of the head. The length is about 107 mm., with the maximum width, exclusive of parapodia, 6 mm., this being attained near the twelfth somite. But this width changes but little and only very gradually caudad, the body appearing almost uniform in width; a little in front of the caudal end the width is 5 mm. This is an exceptionally robust specimen, but others form a complete transition to the more slender and usual form.

Prostomium acuminate from the base as usual, sides a little convex, and anterior end acutely rounded; depressed, the ventral surface flat, with a median longitudinal furrow, and the dorsal surface moderately convex, with a slight crescentic elevation at base; thick at base, decreasing in thickness distad; wider across base than long.

Peristomium crossed on lower part of sides and ventrally by a series of fine sulci which laterally are faint but ventrally become distinct and end in an emargination in the anterior border. Palpal cushions well marked, simple, rounded tubercles, or pads, which are wider than long.

The parapodia of the specimens here listed have the usual character. In the anterior parapodia there is a distinct, postsetal, foliaceous lip which is at first low and extends proximad along the ventral surface, and a smaller, presetal, less foliaceous lip as well. In proceeding caudad the postsetal lip becomes more and more elongate and finger-like, extending in a caudal direction; the presetal lip more slowly elongates, but in the posterior region is as long as the postsetal process and extends more or less dorsad; the processes are slender and mobile and commonly much exceed in length the parapodia proper, this showing considerable variation in the preserved specimens.

Both the hooked and the capillary setae are long. The limbate capillary setae are distally of the form shown in Plate **60**, fig. 8, 9. A typical hooked seta is represented in Plate **61**, fig. 1. The acicula are blackish and often protrude conspicuously beyond the surface of the parapodia.

The mandibles are opaque and brown except for anterior tips which become darkened, blackish; the masticatory plate is deeply incised anteriorly and the plate is marked, as is common, with a series of transverse parallel lines as shown in the figure. The relative width across the anterior end is greater than, *e.g.*, in *L. japonica* Marenzeller and *L. japonica index* Moore. (See Plate **60**, fig. 6). The maxillae are black; the second pair are provided with four or five teeth (rarely with six), which decrease in size caudad and are of the general form shown in Plate **60**, fig. 7; the third pair are conspicuously narrowed into a slender process at the mesal end, and are unidentate.

The color throughout is a more or less yellowish brown.

LOCALITIES. Off Mexico: Sta. 3418 (lat. 16° 31′ N., long. 99° 52′ 30″ W.). Depth 660 fms. Bottom of brown sand with black specks. Bottom temp. 39° F. 1891 Exped. Two specimens and some fragments.

Off Mexico: Sta. 3424 (lat. 21° 15′ N., long. 106° 23′ W.). Depth 679 fms. Bottom temp. 38 F. 18 April, 1891. Two specimens.

Gulf of California: Sta. 3435 (lat. 26° 48′ N., long. 110° 45′ 20″ W.). Depth 859 fms. Bottom of brown mud with black specks. 22 April, 1891. One specimen of about the same size as those from Sta. 4631.

Between Panama and the Galapagos Islands: Sta. 4631 (lat. 6° 26′ N., long. 81° 49′ W.). Depth 774 fms. Bottom of green sand. 3 November, 1904. Two smaller specimens, of which the larger has a maximum width of 3.25 mm., exclusive of the parapodia.

This species seems to occur rather abundantly from southern Chile northward at least to Monterey Bay, and its bathymetrical range is also correspondingly great, it having been recorded at depths from 36 to 2,182 fms.

It is characterized by its conspicuously elongate parapodial processes. The maxillae would at first seem to separate these specimens clearly from the form described by Ehlers. In Ehlers's figures, the maxillae are given the form seemingly widely different from that usual in the genus; but an appearance very similar is secured when the pieces are viewed edgewise, and I am inclined to think the artist has so drawn them rather than that the type is abnormal as supposed by Moore. The type is a very small specimen, and proper orientation of the maxillae, if drawn *in situ,* would be difficult. A specimen of about the same size as Ehlers's type has the prostomium of the more elongate proportions given by that author, so it is likely this difference is one due to age.

CENOTHRIX, gen. nov.[1]

Prostomium subconical or ovoid, smooth, devoid of tentacles or palpi.

Body elongated, with numerous distinct segments, tapering both anteriorly and posteriorly.

First and second somites lacking parapodia and setae. Nuchal processes not evident.

Parapodia essentially uniramous, the notopodium reduced to a slight tubercle. Ending in a finger-like, postsetal process, but with no presetal process.

All setae simple, partly limbate, and partly of the stout, crochet type with membranous guards, but the latter without teeth or hooks. Limbate setae in all parapodia and one crochet in each parapodium excepting the most anterior. Setae in type-species few and largely definite in number.

Five pairs of maxillae. The carriers of the first pair extended caudad into long, slender, tendon-like processes, the plates dentate, unequal. Maxillae II, III, and IV dentate and unequal. Maxillae V reduced to simple hooks. Mandibles mesally in contact in the broad anterior region, the stems short and scarcely narrowed caudad.

GENOTYPE.— *Cenothrix mutans*, sp. nov.

In the characters of the jaws this genus falls into Grube's Eunicea Priognatha of group B (Jahresb. Schles. gesellsch., 1879, **56**, p. 80), including Drilonereis, Arabella, etc., but it differs in having setae of two main types, in which respect it agrees with genera of his group A. The crochets, however, are of a peculiar structure and, furthermore, do not increase in number caudad and in the posterior region occur to the exclusion of the limbate type. Thus it differs from Larymna Kinberg (Zygolobus Grube), *e.g.*, in the greatly elongate, spine-like, stems of maxillae I, in the edentate character of the crochets, and in the uniform distribution of limbate setae on all parapodia; and, on the other hand, it differs at once from Arabella in having setae of the crochet-type at all. It is, I believe, close to Notocirrus Kinberg, the type of which also comes from the South Pacific region; but, particularly in view of some uncertainty in regard to important details in the type of Notocirrus, I have felt it necessary to keep the forms apart. The spine construed by Schmarda as a hooded crochet in his type-species differs from that in Cenothrix in being distally bidentate and in the much smaller, rounded membranous guards.

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[1] καινός, new, strange, and θρίξ, bristle.

CENOTHRIX MUTANS, sp. nov.[1]

Plate **61**, fig. 1–9; Plate **62**, fig. 1.

The type as preserved is throughout grey, in part of a weak flesh color or delicate rose tinge.

The body is elongated and slender, terete. It is tapered at the ends, but elsewhere is nearly of uniform diameter, being but slightly thicker anteriorly than posteriorly. The length is approximately 107 mm., the maximum width, exclusive of parapodia, 1.6 mm. The number of somites is about 280, the coiled condition of the type rendering exact counting difficult.

The prostomium is ovate, clearly longer than wide, with the anterior end narrowly rounded. A little flattened dorsoventrally. Surface very smooth. On the ventral surface there is a weak median longitudinal furrow which does not reach either end and is bounded laterally by slight, broad ridges, which are confluent caudally in front of the mouth. Palpi not distinct. Eyes none. (Plate **61**, fig. 4).

The peristomium is set off from the prostomium by a deep constriction. It is much shorter than the prostomium, but is wider. It and the second somite together are about two thirds as long as the prostomium. The outline in passing from prostomium to peristomium is abruptly changed, but from the peristomium caudad it is evenly continuous. Both peristomium and the second somite are apodous. The peristomium is much longer than the second somite laterally, as it there curves conspicuously forwards, but is slightly incurved at the middle above. On the ventral side it is but little longer than the second somite and is crossed longitudinally by a few distinct sulci. The second somite is of nearly uniform length above and below, and is throughout deeply separated from the peristomium. (Plate **61**, fig. 4).

The succeeding somites are all simple and regular, and are smooth excepting for a few weak, often somewhat oblique, sulci crossing the somites longitudinally and evident only under the microscope. The cuticle has the usual shining and iridescent appearance. A few sulci may be more distinct in the middle and posterior regions. Each parapodium is inserted in a sharply marked furrow crossing the somite longitudinally. The somites increase in length to about the seventeenth, after which the length is uniform, or nearly so, to the caudal end of the body. The somites, more particularly in the anterior region, curve forwards on each side just in front of the parapodium.

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[1] mutare, to change.

The pygidium has a highly peculiar form in the type which may possibly be the result of regeneration. It is abruptly very much narrower than the preceding somite. It presents a basal division, which has a convex surface and narrows caudad and may represent a distinct somite, and a more slender, cylindrical, distal division, which bears at its distal end two stout cirri, which are contiguous at the base, are very short, in length less than the diameter of the adjoining region of the pygidium, and are bifid at the distal end.

The parapodia are strictly lateral and about equidistant from dorsal and ventral lines. All are small, the most anterior ones being smallest, while the caudal ones are not reduced. All are short and cylindrical with no distinct presetal lip but with a very conspicuous postsetal finger-like process which is cylindrical, or rather slightly conical, and rounded at the tip. The postsetal process extends ectocaudad. It is of the same form and proportionate size throughout the body. The notopodium is represented by a slight tubercle above at the base of the neuropodium. No cirri are evident. No branchiae at all. (Plate **61**, fig. 9).

The neuropodial acicula are normally two in number. They are stout at base and rapidly narrow to an acute fine tip. Each is slightly curved, with the concavity ventrad. (Plate **61**, fig. 5). The more dorsal aciculum is pale yellow excepting the slender tip, which is colorless. The ventral aciculum is pale yellow proximally, but toward the tip becomes much darker brown, the tip colorless, as in the other. The setae are all simple and are of two types, capillary ones and stout spines. Of these the former are colorless, the latter yellowish. The capillary setae are all of the usual bilimbate type and all are bent a little above the proximal end of the limbate region, some abruptly so, or geniculate. In the latter type a limbus, as seen in side view, is proximally broad, narrowing gradually distad, and fading out at base of the long slender tip; at the base along the convex free margin is a series of projecting teeth or scales, the edge elsewhere smooth. (Plate **62**, fig. 1). In the other type the limbi are narrower and lack the scales, or have these but obscurely indicated and not projecting at all as teeth. (Plate **61**, fig. 8). In the middle region a parapodium has ordinarily but one of the more strongly curved, scale-bearing, limbate setae, and only two of the other, smooth limbate, type. Of the stout spines, never more than one seem to be present in any parapodium. These are yellow in color throughout and are stout and curved. Each of uniform diameter excepting at the distal end, where it narrows conically and is wholly without terminal teeth or subapical spur or process; the membranous guards are very unsymmetrically developed, one being short and not surpassing the tip of the seta, while the other one, attached on the opposite side, is very much prolonged beyond it and is narrowed distad into a slender tip. (Plate **61**, fig. 6, 7). How far forward the crochets extend was not satisfactorily determined.

There are five pairs of maxillae, which are all dense black in color. In maxillae I the carriers are clavately widened at the anterior end, narrowing strongly caudad into very long, slender, chitinous spines which *in situ* extend back into the tenth somite and narrow very gradually, parallel, or nearly so; each spine appearing a little incurved just caudad of the expanded end, where the two come in contact. The dentate plates are large, subtriangular, with the apex cephalad, unsymmetrically developed; the left plate is broader than the right and bears teeth along its entire mesal edge as present in the type, though it appears broken off at the distal end and may in that part have had a smooth edge; these teeth are large, retrorse, and eight in number; the right plate with eight smaller teeth along the mesal edge in a series that extends from the proximal end only to the middle, leaving the distal acuminate half smooth. Maxillae II are also unsymmetrically developed, the right one being much larger; it presents two arms meeting at an acute angle anteriorly; the inner arm extends proximad along the mesal side of maxillae II, the base of which it nearly attains, and bears a series of fifteen or more teeth; the anterior arm is shorter and extends down the outer side of the second maxilla. The much smaller left maxilla II is also bent into an angle into which the left maxilla I extends; the inner arm is short, extending but slightly down the mesal side of the first maxilla, and bears seven teeth; the outer arm is very much smaller. Each maxilla III is similarly bent into an angle fitting about the anterior end of the corresponding maxilla II; the inner arm is also the longer and bears about five teeth. The right plate the larger. Maxillae IV are likewise unequal, the right plate being the larger. The right plate bears three slender, acute teeth, and a fourth, the most anterior, blunter one. The left plate presents above a single slender, bifid tooth and below a rounded prominence bearing a minute acute point. The fifth maxillae are reduced to simple hooks, each hook being long, slender, and evenly curved, and arising from a heavier basal piece. (Plate **61**, fig. 2). The mandibles are black in color like the maxillae. Each one is a short, strongly clavate piece, narrowing caudad, and in contact with the other plate anteriorly; anteriorly the inner edges diverge from the point of contact and form an acute reentrant angle; the anterior end of each is truncate. (Plate **61**, fig. 3).

Locality. Easter Island. Shore. 20 December, 1904. One specimen.

Cenogenus, gen. nov.[1]

Prostomium conical, smooth, devoid of processes and eyes.

Two first somites lacking parapodia and setae. A conical nuchal process present at anterior edge of first segment above, this often retracted.

Four pairs of maxillae present, these well-developed plates, but all edentate, or the second alone with dentiform processes. First pair in form of strong hooks; carriers short, without slender posterior supports, or these obsolete.

Mandibles united mesally in the broad anterior region, where they have well-developed dental plates; stems slender and short, tapering caudad.

Parapodia essentially uniramous. Distally with a short, finger-like, postsetal process, but with no presetal process. Notocirri abortive.

All setae simple, in anterior region exclusively of a slender limbate form, but in posterior region with in addition a single, stout, crochet-formed, hooded seta in each parapodium, the guards of this rounded and short.

Genotype. — *C. descendens*, sp. nov.

Cenogenus descendens, sp. nov.

The body is but little narrowed cephalad, more strongly so caudad. Strongly convex dorsally, notably less so ventrally.

Prostomium conical, broader than deep, and sometimes appearing much compressed dorsoventrally; short, the width equalling or exceeding the length. Smooth throughout. The anterior region flattened, or sometimes a little concave beneath in front of a moderately bulging basal region. Much exceeding the combined length of the first two segments.

Peristomium set off by a deep sulcus from the prostomium. Dorsally it is twice as long as the second somite. Beneath it usually protrudes ventrad as a swollen transverse ridge, or lower lip, with a rounded lobe extending forward at each end and curving about the mouth to meet that of the other end in the front of the mouth-opening. Swollen all the way around, so as to rise above the level of the second somite dorsally also. Narrowest at sides where it is crossed longitudinally by a few sulci. Second somite longer dorsally than ventrally.

Succeeding somites simple, regular, and smooth. They are of almost uniform length from the first setigerous caudad, all short.

Form of pygidium unknown.

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[1] καινός, strange, and γένυς, jaw.

Parapodia lower on first few segments than on the following ones. Nearer the ventral surface than to the more convex dorsal one. In general short and cylindrical, those of the most anterior segments much reduced in length. Without cirri. No trace of a presetal process, but a distinct postsetal process present. This cylindrical, slender, finger-like, and short, being considerably less than the diameter of the parapodium.

Acicula of neuropodium normally three in number, these stout, straight, and tapering distad to an apex that is not fine, this acute but with its sides convex. Of these acicula two are ordinarily deep black in color or paler only at tips, the third lighter, more brownish.

The ordinary setae distally become thin and blade-like, this region obliquely finely striate and narrowing to a fine tip, this distal thin region gently doubly curved, but not at all geniculate and not at all dentate at base. In each of the posterior parapodia there is, in addition to the ordinary setae, a single stout spine at apex narrowed in a short, distally rounded tip protected by membranous guards, the latter short and rounded; the protected tip in some cases appears to be incised or narrowly divided. The setae are dark brown proximally and pale distally.

There are four well-developed pairs of maxillary plates, none of which bear true teeth. All are black throughout. The carriers of the first maxillae with the posterior stems short; no posterior supports, or these rudimentary, if present being short, thin and pale. Hooks of first maxillae longer than carriers, stout and evenly curved. Second maxillae stout, heavy plates lying contiguously between the hooks of I; each presents ventrally two large, stout, rounded processes, one near middle and one toward anterior end. Plates of III and IV without teeth or processes. None of the cotypes is complete posteriorly.

Mandibles with masticatory plates very large, the stems short and slender, shining white ventrally.

Greatest width of type, exclusive of parapodia, 3.2 mm.

LOCALITY. Peru: 111 miles N. W. of Aguja Point. Sta. 4651 (lat. 5° 42′ S., long. 83° W.). Depth 2,222 fms. Bottom of fine, sticky, grey mud. Bottom temp. 34.4° F. Several specimens, all incomplete. 11 November, 1904.

OENONE Savigny.

Descript. Egypte. Hist. nat., 1809 [=1822], **1**, pt. 3, p. 14, 55; EHLERS, Borstenwürmer, 1868, p. 407; GRUBE, Jahresb. Schlesch. gesellsch., 1879, **56**, p. 83; AUGENER, Fauna Südw.-Austr. Polych. **1**, 1913, **4**, p. 290.

Aglaura Savigny, *Op. cit.*, p. 13, 54.
Andromache Kinberg, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 571.
Aglaurides Ehlers, Borstenwürmer, 1868, p. 407, 408; Grube, Jahresb. Schlesch. gesellsch., 1879, **56**, p. 83.

Oenone telura, sp. nov.[1]

Plate **62**, fig. 2–5.

The color of the type at present is a brownish grey, appearing to have been partially bleached in preservation.

The body is comparatively short, widest in the middle region and narrowing at the ends, the caudal region being the more slender. The body is strongly arched dorsally and much more weakly convex ventrally. The neural furrow is but slightly indicated. The length is about 60 mm., the body, however, being in a strongly contracted condition, apparently from having been dry at some time. The greatest width, exclusive of parapodia, is 3 mm. The total number of somites is in the neighborhood of 208.

The prostomium in outline as viewed from above is subsemicircular, but evidently longer than wide. It is flattened dorsoventrally, and is deeper posteriorly than anteriorly. The surface appears to have been wholly smooth, a certain present wrinkling being apparently due to shrinkage, and it lacks all trace of appendages. The eyes are covered in the type. The lateral ones are very much the larger, and are elliptic and somewhat oblique. (Plate **62**, fig. 3).

There are, following the prostomium, one complete achaetous and non-parapodia-bearing somite and one somite incomplete above. The relations of these two somites to each other seem to be as follows: the second one is obliterated above and laterally, but is distinct and sharply limited by deep furrows ventrally, where it appears like the corresponding region of succeeding normal somites; the first somite is much longer and is similarly decidedly longer than the third somite, but shorter than the third and fourth together; it is weakly divided dorsally by a transverse furrow, the two divisions equal, is wholly smooth on the sides, and is ventrally again divided by a transverse furrow that lies much nearer to the caudal margin than to the anterior margin, the anterior division being carried conspicuously forward as a lower lip. The anterior margin of the lower lip is straight. The lateral margin of the somite on each side is a little concave and the dorsal margin is straight. (Plate **62**, fig. 3).

The ordinary metastomial somites are very short and closely crowded.

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[1] τηλουρός, remote.

They are highly arched above and flattened beneath, with no distinct neural furrow. They are entire or may show above a vague transverse furrow, and are smooth excepting for a few weak longitudinal sulci. (Plate 62, fig. 3).

The pygidium is comparatively very small, and bears four, foliaceous, distally narrowed cirri.

Parapodia, inclusive of processes, mostly about one fourth the width of the body. Uniramous. Neuropodium cylindrical, produced at the distal end into two flattened lobes, one postsetal and one presetal. The presetal is short and distally evenly rounded; the postsetal lobe is much longer, and is distally moderately narrowed and is also convexly rounded. The notocirrus, attached to a short cirrophore near the base of the foot above, has the style narrow at base and then expanded into a conspicuous foliaceous blade which is oblong or oblong-lanceolate in outline, with the distal end usually convexly rounded, or in some (more caudal ones) subacutely narrowed. (Plate 62, fig. 4).

The setae are arranged in a subvertical line extending in the crevice between the presetal and postsetal lips and proximad of these on the ventral side. They are of two types. The more delicate, colorless, and transparent capillary setae form the upper part of the series and are much the more numerous. They increase typically in length dorsad. Each is flattened and narrows distad to a very fine tip, and is curved or somewhat angularly bent near, or distad of, the exposed part. The ventral setae, which are of the crochet-type, and ordinarily two in number, are similarly colorless and transparent. They are shorter and much stouter. Toward the distal end each narrows to a cervix at which it bends somewhat dorsad and bears two short, obtuse teeth of which the proximal one is decidedly the larger and is ordinarily weakly bifid, with the upper denticulation the smaller. The membranous guards are equal. They scarcely exceed the teeth, and their distal edge is straight and a little oblique. (Plate 62, fig. 5). The aciculum is stouter proximally than a crochet; it has a very weak double curve and its acute distal end projects slightly from the surface.

The mandibles and maxillae are black. The mandibles have stems which are short, acute caudad, and widen clavately cephalad. At the distal end each bears a masticatory plate which is shortly oblanceolate in form; toward the distal end the mesal edge of each presents a weak reentrant angle, and there are a few small weak undulations, or teeth, near this and on the distal edge. There are five pairs of maxillae. Of these the fifth are in the form of simple curved hooks. The fourth are dentate plates presenting at the distal end a longer hook and proximad of this five stout teeth on the right side and four on the left. Each third maxilla has distally a very stout, curved claw and, proximad of that, five small teeth. Each second maxilla has an arm extending along the mesal side of maxilla I and a shorter, distally blunt, arm extending down the ectal side; along the mesal arm is a series of stout teeth of which the next to the most anterior is a long, stout hook much exceeding the others in size; on the right plate is a total of eleven or twelve teeth, and on the left but seven, the teeth in each case extending to the proximal end of the inner branch, which is much shorter on the left plate. The carriers of the first maxillae are produced caudad as exceedingly long and slender, tendon-like processes which bend abruptly mesad and unite at the caudal end; at the anterior end each widens into a triangular plate with base cephalad; behind each of these anterior plates the carrier is concavely excised, as usual, and bears a forwardly directed process or tooth. Each of the maxillary plates is extended ectad into a thin process, that of the right being the larger and more conspicuous. The right plate proper is small, scarcely larger than its clavate ectal process, and bears along its mesal border a series of six teeth, with at the distal end a seventh, somewhat larger, hooked tooth. The left plate is much larger, being extended cephalad into a stout smooth hook, and bearing along the mesal edge proximad of this a series of three teeth followed by a long smooth raised edge or ridge. (Plate **62**, fig. 2).

LOCALITY. Marshall Islands. 12 fms. January, 1900. One specimen which came up on the anchor of the ALBATROSS.

This species in general structure and appearance is close to *O. lucida* Savigny, type-species of the genus. It presents no trace of obscure antennal nodules indicated in some specimens of *lucida,* but apparently subject to retraction like true nuchal organs. The maxillae are very similar to those of *O. lucida* (*O. diphyllidia* Schmarda) as figured by Ehlers (Mem. M. C. Z., 1887, **15**, pl. 34, fig. 6) and by Willey (Ceylon pearl oyster fisheries report, 1905, pt. 4, pl. 5, fig. 107) and as exhibited in West Indian specimens, but differ in various details. In maxilla II the great fang is the one next to the most anterior one instead of the most anterior; the third right maxilla has but five teeth, exclusive of the large fang, instead of seven or eight, though five may occur in some specimens of *lucida,* and is in this regard the same as the left one instead of having more numerous teeth. The left maxilla I has but three teeth and a smooth ridge instead of eight teeth. The ectal process of the plate of I is differently shaped. Each mandible does not project angularly ectad at its distal end on the outer side as figured for *lucida.* The crochets of *lucida* do not show the same inequality in the terminal teeth, with the larger one bifid. A most striking and important difference between the two species is in the relationship ventrally between the two achaetous somites. In *lucida* the second one projects broadly forward to the border of the mouth, thus completely dividing the first one, whereas in *telura* the second annulus is separated from the first by a deep transverse furrow. It thus diverges not only from species of Oenone, but likewise from those of Lumbrinereis, etc., in which the first annulus is similarly ventrally separated by the forward protrusion of the second. The lower lip is carried clearly forward farther than in *lucida.* The latter species, according to Augener's interpretation, is extremely widespread. He believes it to include the following: — *Oenone diphyllidia* Schmarda, *Oenone pacifica* Fischli, and *Aglaurides erythraensis* Gravier; also possibly *Danymene fouensis* Kinberg.[1] He makes the genus, in fact, monotypic; but I am convinced that the form above must be held to be different unless the variability in maxillae II, of the crochets, and especially in the relation of the first somites, are much greater than is indicated by present evidence.

DORVILLEIDAE.

In these annelids the body is composed of but a moderate number of somites and is slender and cylindrical in shape, or sometimes fusiform.

The prostomium is distinct and is rounded, horseshoe-shaped to quadrangular and pentagonal in outline. It bears a pair of palpi, one pair of articulated tentacles, or else four similar, nonarticulated appendages. Eyes four. Nuchal organs primitive, open, ciliated surfaces.

The first two somites lack appendages.

The parapodia are structurally biramous, though in appearance uniramous, having ventral cirrus and dorsal cirrus with a basal joint or cirrophore supported by an aciculum.

The dorsal fascia of the parapodia consists of simple setae, the ventral of composite ones.

The pygidium bears either two or four anal cirri, when four are present two being shorter than the others.

The proboscis armed with a pair of mandibles and numerous maxillae in two series.

Swarming at the surface of the ocean similar to that occurring in the Palolo worms, mentioned under the Leodicidae, is known in the family and has been described in detail for *Dorvillea gregarica.*[2]

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[1] *Cf.* Augener, Fauna Südw.-Austr. Polych. **1**, 1913, **4**, p. 290.

[2] *Cf.* Mayer, Bull. M. C. Z., 1900, **36**, p. 1.

These forms occur mostly between tide-marks, and are commonly found under stones, or in but shallow water. In their alimentary canals have been found such debris as sand, diatoms, spicules of sponges and fragments of crustaceans. The forms observed appear to be comparatively hardy in captivity. Some have been seen to swim freely (*e.g.*, *D. rudolphi* and *D. kefersteini*, *fide* Eisig and McIntosh) with a wriggling motion, or to crawl about actively. *Ophryotrocha puerilis* has been found in the body-cavity of *Cucumaria plance* at Naples by Monticelli (Monit. zool. Ital., 1892, **3**, p. 250).

Key to Genera.

a. With two articulated or moniliform tentacles and two palpi................*Dorvillea* Parfitt.
aa. With four similarly formed tentacles, or processes, which are simple and non-articulated.
Ophryotrocha Claparède and Mecznikow.

Synonymy of Genera.

Staurocephalus Grube (1855) has long been used for the more important genus of this family, as has Staurocephalidae for the family; but unfortunately Staurocephalus was previously used in Crustacea (1846). Dorvillea Parfitt (1866, type *D. lobata* = *Staurocephalus rubrovittatus* Grube) is the next name applicable to the genus. This differs in spelling from Dorvillia, applied by Leach to a lepidopterous genus in 1815, and must therefore stand as a distinct name.

Paractius Levinsen (1879) is here included under Ophryotrocha Claparède (*O. puerilis* Claparède and Mecznikow, the type of the latter being, in fact, possibly the same as *P. littoralis* Levinsen, the type of the first),— as is also Stauroceps Verrill (1900), proposed as a subgenus of Stauronereis.

Dorvillea Parfitt.

Zoologist, 1866, ser. 2, **1**, p. 113.
Staurocephalus Grube, Archiv. naturg., 1855, **21**, p. 97.
Anisoceras Grube, Vid. meddel., 1856, p. 60.
Prionognathus Keferstein, Zeitschr. wiss. zool., 1862, **12**, p. 99.
Stauronereis Verrill, Trans. Conn. acad. sci., 1900, **10**, p. 647.
Teleonereis Verrill, *Ibid.*, 1900, **10**, p. 648.

Dorvillea crassa, sp. nov.[1]

Plate **62**, fig. 6, 7; Plate **63**, fig. 1.

The general color is dull brown, with the parapodia scarcely paler. No markings.

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[1] crassus, stout.

The type is incomplete posteriorly. The part present consists of fifty-one somites. It is 26 mm. long and has a maximum width, exclusive of the parapodia, of 3.4 mm., and inclusive of the parapodia, of nearly 5 mm. The body is widest at and immediately caudad of about the eighth somite. Cephalad of this the body is rounded, somewhat like the frustrum of a cone with the truncate end narrow. Caudad the body narrows continuously and much more gradually.

The principal portion of the prostomium in outline as seen from above is semicircular, the anterior margin being strongly convexly rounded. It is deep dorsoventrally, with the ventral portion much narrower than the dorsal. There is a very large, circular, black ocular area, or eye, on each side just in front of the posterior paired tentacle, the diameter of which it exceeds, and a much smaller, longitudinally elliptic eye just mesad of each posterior paired tentacle. On the ventral side are two thick, somewhat conical, bodies extending from the bases of the palpi caudad to the mouth; they are contiguous and are distally free as conical projections. Two pairs of distinct appendages are present in the type. Each of the anterior pair, ordinarily interpreted as palpi, is attached on the ventral surface in the angle between the ventral lobes above mentioned and the ventral projection of the prostomium. The two palpi are separated by less than their diameter, being unusually thick. Each tapers strongly distad and is at present transversely wrinkled, or jointed, so as to appear to consist of rather numerous short articles and a distinct terminal lobe such as present in various other species. The tentacles, which are of about the same length as the palpi, are much less stout and are cylindrical. Each is set deeply in an excavation in the caudolateral region of the prostomium and extends dorsad. Each is attenuated, but more gradually so than the palpi, and is strongly transversely wrinkled or jointed, the joints numerous. At present they extend only to the fifth somite but appear to have contracted considerably in preservation. A nuchal tubercle shows in the median line above under the projecting border of the peristomium.

The peristomium is about equal in length to the prostomium and is much longer than the second somite. On each side it presents a lobe anteriorly partly separated off above and below by a sulcus, this lobe abutting dorsally against the posterior paired tentacle and in front against the anterior paired appendage. On the ventral side it is deeply excavated semicircularly, leaving the portion caudad of the mouth as a narrow band. The border caudad and laterad of the mouth strongly radially furrowed or wrinkled.

The second somite wholly lacks tentacular cirri or other appendages, like the peristomium. It is of uniform length above and laterally, but is shorter ventrally.

The other metastomial somites bear parapodia. The third somite is shorter than the second, the following ones decreasing to the fifth or sixth, with those from this to the twelfth very short, after which a length greater than that of the second somite is rapidly attained and maintained with little variation to the end of the fragment (fifty first somite). The region of very short somites (*i.e.*, the fifth to twelfth) is the deepest part of the body as well as somewhat the widest. All metastomial somites are strongly convexly arched above and are flattened ventrally. There is a well-marked neural furrow along the venter, this deepening caudad.

The most anterior parapodia agree essentially with the others excepting in being shorter. A typical parapodium from the anterior region is strictly uniramous. It is more or less flattened in the cephalocaudal direction, is deeper proximally than distally, and at the distal end bears two thin, distally rounded, flaps extending entirely across the end of the parapodium, but not high. These are the postsetal and presetal lobes and are essentially equal in size and alike in form. Caudad these lobes become gradually lower and lower. All parapodia bear neurocirri. Each neurocirrus is attached on the ventral side at the base of the neuropodium. It is thick proximally, tapers conically, and nearly attains the end of the neuropodium. All parapodia also bear notocirri. Each of these is attached above at the extreme base. It is exceptionally stout, tapers conically to an acute point, and in length conspicuously exceeds the parapodium. Some of the notocirri are considerably flattened and all appear to have a large axial blood-vessel.

In each parapodium there is a single stout aciculum, which is colorless, or in some cases slightly yellowish. Each is curved proximad of the middle, with the concavity ventrad. The apex is acute, but not especially fine. On the dorsal side of the aciculum in a typical parapodium there is a fascicle of simple, strongly flattened, setae, each of which is apically bidentate and has a membranous shield over the teeth. (Plate 62, fig. 7). Along one edge these setae are finely serrate, the teeth or scales short. The setae on the ventral side of the aciculum are much more numerous and form a more extended fascicle. They are coarser than the dorsal ones and are all compound. In these the shaft enlarges clavately from point of emergence distad to a little proximad of its distal end, then again narrowing slightly to the oblique margin of the socket.

The distal portion of the edge of the shaft on the side of the acute distal angle is finely dentate. The distal piece in the compound setae is moderately long, more slender than the shaft, and of uniform diameter until the hooded distal region is reached, where it narrows as usual; there are two teeth, the distal one much the larger and strongly curved, the subapical one small, acute, and projecting at right angles to the general axis; the guards distally rounded, not rising above the level of the distal tooth. (Plate 63, fig. 1).

The mandibles are large and solidly black throughout. The two pieces are narrowly connected at the level of the proximal ends of the masticatory plates. Each masticatory branch diverges widely from the other one; they enlarge ectad, with the distal margin curving convexly and extending almost directly ectad at the distal portion; the margin is smooth over its proximal portion, toward the middle becoming wavy, and over the distal portion strongly dentate; the most distal teeth are long, curving a little mesad. The shafts are widely separated. Each is of nearly uniform diameter caudad to a little behind its middle, where they expand a little, and then narrow to the acutely pointed caudal end; each shaft is bowed moderately ectad, the caudal ends of the two bending in towards each other. (Plate 62, fig. 6). The numerous small maxillae form two long articulating series on each side, the two series being in contact anteriorly and caudally. Each maxilla bears a single long, simple, curved hook. The maxillae and hooks are longest in the middle region of the series, those of each series decreasing gradually toward the ends. At the proximal end each inner series is continued by a smooth, unsegmented, tendon-like, chitinous piece, which is slenderly acute at its proximal end. Each outer series is proximally continued in a similar way by a wider, smooth, chitinous piece which expands caudad, bends more or less into a vertical position, and unites with the one of the opposite series to form a V-shaped piece.

LOCALITY. Marshall Islands. Came up on the anchor from a depth of 12 fms. 1899–1900 Exped. One specimen.

This species is in the group having a distinct terminal piece to the palpi. In the numerous articles in the tentacles it resembles the New Zealand species, *D. incerta* (Schmarda) (*D. australis* Haswell). From that species, however, it differs in numerous details. Unlike *incerta,* its notocirri do not have terminal articles. The preocular area of the prostomium is shorter than in that species and the anterior eyes, a very striking feature of the species, are much larger, The notocirri are longer. An important difference is in the presence of the conspicuous lobes at the end of the parapodia, these being absent in *incerta* or the postsetal lip being but weakly indicated. *D. australiensis* (McIntosh) differs from the present species in having the palpi much shorter relatively to the tentacles, and in the greater length and more numerous articles of the latter, the form and proportions of palpi and tentacles in this species much suggesting those of *D. filicornis* (Grube) from Singapore; the anterior margin of the mandibles are smooth or nearly so, lacking the conspicuous, hook-like, teeth of *crassa;* in the form of the maxillae, the hooks of which are proximally toothed; in having a distinct terminal joint to the notocirri; and in the detailed structure of the setae. *D. brevispinis* (Grube) from Singapore is a much smaller species than *crassa* and has distinct terminal joints to the notocirri. *D. crassa* agrees with *D. australiensis* and, among others, with *D. rubrovittata* (Grube) (*erucaeformis* (Malmgren)) in having a conspicuous, median dorsal, nuchal papilla.

GLYCERIDAE.

In this family the body is elongate, cylindrical and often slender, tapered at the ends, and is composed of numerous somites. The coloration is not conspicuous, being pale and uniform. Species often appear reddish because the blood shows through the integument, this being colored red by large coelomic corpuscles which contain haemoglobin.

The prostomium is in the form of an elongate cone, which is strongly annulated and bears at or near its apex four small tentacles. The basal ring is much longer than the others. Eyes may be either present or absent.

A retractile nuchal organ, sometimes spoken of as a "palpus," occurs on each side at the base of the prostomium.

The somites in general are composed of two or more annuli. The parapodia are all of one form throughout the body, and either uniramous or biramous.

Notopodial setae, when present, are simple, typically narrowly limbate and marginally serrate. The neuropodial setae are composite, with the distal appendage acutely tipped and serrate along the edge.

Branchiae may be either present or absent; when present either simple or branched (bifurcate).

Nephridia with inner end closed and in connection with groups of solenocytes.

The proboscis is a strongly muscular and protrusible organ which is glandular at its base and is armed normally with four similar chitinous hooks, or jaws, and bears distally eighteen papillae, of which one is middorsal and one midventral in position. The glands seem to be toxic to certain organisms preyed upon.

It is now established that epitoky occurs in this family, certain forms, at least, acquiring at the time of sexual maturity long, natatory, notopodial setae similar to those acquired in various other epitokous forms, the parapodia elongating at the same time. Also with the development of the sexual products the musculature undergoes reduction, the proboscis degenerates, and its jaws may become detached and disappear. At this period of sexual maturity the animals, of course, become pelagic, as is so frequently the case in other forms of similar mode of life.[1] A very interesting case of epitoky occurs in the new genus Telake (p. 345).

The glycerids frequent especially sandy mud at moderate depths. Sometimes they are cast up on the shore at beaches, and also at times are found under stones and in the fissures of rocks between tide-marks. They have been dredged mostly at depths ranging from three or four to a hundred fathoms. *Glycera capitata* Oersted was dredged by the PORCUPINE at 664 fathoms; and the ALBATROSS dredged *Hemipodus mexicanus*, sp. nov., at 628 fathoms, *Glycera profundi*, sp. nov., at 859 fathoms; while *G. brachiopoda* Moore has been taken at from 222 to 1,400 fathoms. These cases, however, are exceptional.

Many of the glycerids are active animals which progress through the water with a screw-like motion, probably much the same as that they execute in moving in wet sand. In burrowing in the sand they are seen to apply the snout to the surface, then thrusting out the proboscis forcibly and rapidly, and moving step by step into the successive depressions thus made, in the same manner as occurs in Nepthys.

Key to Genera.

a. Body of the pelagic form presenting two sharply distinct regions, in the posterior of which only simple setae occur . . . . *Telake*, gen. nov.
aa. No such division with parapodia of posterior region bearing only simple setae.
  b. Parapodia uniramous . . . . *Hemipodus* Quatrefages.
  bb. Parapodia biramous.
    c. Proboscis short; supporting piece of maxilla rod-shaped . . . . *Glycerella* Arwidsson.
    cc. Proboscis long; supporting piece of maxilla triangular or bifurcate.
      d. Proboscis without hard, dentate processes among softer papillae . . . . *Glycera* Savigny.
      dd. Proboscis with numerous toothed or hooked pieces among softer papillae. *Hemiglycera* Ehlers.

Synonymy of Genera.

Kinberg (Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 245) transcribes the "Hemipode" used by Quatrefages in his note on Classification of annelids in the Compt. rendus, 27 March, 1865, as Hemipodia. Quatrefages's name was not properly established in this place, however, since he mentions no species in connection with it and does not give a Latin form. Ehlers (Nach. K. gesellsch. wiss. Göttingen. Math. phys. klasse, 1897, p. 81) also follows Kinberg in using Hemipodia. Quatrefages himself, however, in his Hist. nat. annelés gives the usual form, Hemipodus, in the place where the genus is first really established, unless perchance Kinberg's paper appeared before the Annelés, in which case Hemipodia must be used.

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[1] *Cf.* Arwidsson, Bih. K. svenska vet. akad. Handb., 1897, **23**, no. 6, p. 30. Also Gravier, Nouv. arch. Mus. hist. nat., 1906, ser. 4, **8**, p. 135.

TELAKE, gen. nov.

Body of medium size, cylindrical, and slender, tapered at the ends.

Prostomium long and pointed, the length much exceeding the breadth. Bearing at the tip four small tubercles. Eyes none in the adult.

Metastomial somites all two-ringed.

Parapodia all biramous, but of two types as regards size and details of development, and particularly as regards the setae, an anterior group bearing composite and limbate setae in neuropodium and notopodium respectively, and a posterior larger group, bearing only simple non-limbate setae. Each branch of the parapodium bears a single ligula, presetal in position.

Branchiae none. Notocirri present, reduced, nodular in form. Ventral cirrus short, conical to narrowly plate-like.

GENOTYPE.— *T. epipolasis*, sp. nov.

This genus is apparently clearly separated in the character of the parapodia and in the form and distribution of the setae. It resembles ordinary forms of Goniada in having two regions of the body sharply marked off by the character of their parapodia and setae; but differs strongly in having the parapodia of the anterior division biramous and in wholly lacking composite setae in the parapodia of the posterior division. It is, however, probably much nearer to Glycera, which genus has a few species (such as *G. capitata* Oersted, *G. convoluta* and *G. minuta* Czerniawsky) showing epitokous phases in which the individuals swim at the surface. All of these surface-forms were taken at night, as in the case of the present one. The nocturnal habits doubtless account for the rarity of their capture. In the epitokous forms of Glycera there seems to be an appearance of simple setae among the composite neuropodials; but in no case, so far as I can find, is there a division of the body into two regions like those of the Heteronereis phase of the Nereidae and a complete lack in the posterior region of all composite setae. In fact, the change from ordinary atokous phase seems comparatively slight. Hence it is felt necessary to separate the new form as the representative of a distinct genus. The character of the armature of the normal proboscis must probably remain uncertain until the atokous form is discovered, as the epitokous forms commonly lose the jaws, while the proboscis itself undergoes reduction.[1]

TELAKE EPIPOLASIS, sp. nov.[2]

Plate **63**, fig. 4–8; Plate **64**, fig. 1.

Epitokous Female.

The type-specimen has the body-wall colorless and translucent, the viscera showing through giving a slightly brownish tinge.

The body is cylindrical; it is widest near the middle of the type-piece, which would be in front of the middle of a complete specimen, narrowing both ways, the prostomium forming a slenderly pointed anterior extremity. The posterior region of the type is broken off. The type as at present is 23 mm. long, with a maximum width, exclusive of parapodia, of 1.7 mm. The incomplete type consists of sixty-seven somites.

The prostomium continues smoothly the outline of the peristomium and narrows distad to an acute tip, as usual, having a slenderly conical form. It is fused with the peristomium. The prostomium is three times as long as wide at the base. The rings of the prostomium are too vaguely indicated to be counted with any degree of certainty. The type at present shows on the dorsal surface of the prostomium a median longitudinal furrow which reaches neither anterior nor posterior end. On each side there is also a longitudinal furrow extending caudad as far as the rather conspicuous nuchal organ. A ventral sulcus is rather vague and narrow. The tentacles have the usual position and relations at the tip of the prostomium. The dorsal are decidedly longer and stouter than the ventral, the latter being clearly shorter than the diameter of the end of the prostomium. There are no eyes evident. A palpal lobe, low and but slightly differentiated and immobile, lies on each side of the mouth.

The peristomium is fused to the prostomium, and ventrally apparently also with the succeeding somite to form a prominent broad lip, which is crossed radially by numerous fine sulci.

The metastomial somites are clearly defined, cylindrical, smooth. Each is biannulate, the dividing annular surface ordinarily very distinct. The somites increase in length to the region from the fortieth to the fiftieth somites. The last somite of the anterior division (the thirty second) is four times wider than long. As usual, the somites in the more posterior region are a little depressed as compared with the anterior ones.

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[1] *Cf.* Arwidsson, Bergens mus. aarbog, 1908, no. 11, p. 7.

[2] ἐπιπόλασις, lying on or rising to the surface.

The body is divided into two regions according to the character of the parapodia, these being smaller and with much fewer setae from the thirty second somite, inclusive forward, and larger and with longer and more numerous setae from that point caudad. The change takes place abruptly. The parapodia of the anterior region are bifid distally, with slight neuropodial and notopodial lobes which are equal and very similar. In comparison with the width of the body the parapodia are very short and slender, thicker dorsoventrally than anteroposteriorly. Each bears two long presetal lobes, or ligulae, one on each branch, of which the notopodial is the longer. There are no distinct postsetal lips. The neurocirri are attached distad of the middle of the parapodia. Each is broadly united with the neuropodium at its base and is conically narrowed distad, falling short of attaining the end of the neuropodium. The notocirri are attached on the side of the somite, well above the base of the neuropodia. Each is a small nodular body constricted at the attachment and shortly subconically pointed distad. (Plate 63, fig. 4). The anterior pairs of parapodia decrease in length decidedly cephalad, the first two or three pairs in particular being much reduced.

The parapodia of the posterior, or sexual, division of the body are similar in general structure to those of the anterior, but are decidedly broader in the dorsoventral direction, proportionately much more flattened in the cephalocaudal direction, and, as mentioned, have more numerous and somewhat longer, more widely spreading, setae. In a typical parapodium of this region, as for example the thirty seventh, the depth at the base is great and decreases decidedly distad. The ligulae are larger and more foliaceous, each broad at base and narrowed to an acute tip, and extended as a narrow band some distance along the dorsal edge of the notopodium, or the ventral of the neuropodium, as the case may be. The two ligulae are subequal, or the neuropodia may be somewhat larger. On the dorsal side there is a thin vertical membrane running as a narrow convex band proximad to the base of the notopodium, and distad more narrowly about the end caudad of the setae. Above this at the base is the notocirrus, which is in the form of a very small rounded nodule. Along the ventral edge of the neuropodium is attached the neurocirrus. This is somewhat foliaceous and is attached along one entire edge, only the acute distal tip being free, this projecting distoventrad at the edge of the ligula. (Plate **63**, fig. 5).

In a typical parapodium of the posterior region, as in the thirty seventh, there are two pale transparent acicula, of which the neuropodial is distinctly the stouter. The setae are all simple. They taper distad into fine tips, which are normally curved. The setae are wholly smooth, lacking entirely both limbi and teeth. They increase in length from the lowermost dorsad in the neuropodium and in the opposite direction in the notopodium, so that in the series taken together those at the middle are longest, with the others decreasing towards the ends of the series. In the thirty seventh and adjoining parapodia, for example, the neuropodials number mostly from eight to ten, the notopodials six or seven. In the parapodia of the anterior region the notopodial setae are simple like those of the posterior region, but shorter and apparently more flexible, being commonly much curved, often in a conspicuously sigmoid manner, and differing more particularly in being narrowly limbate along one side, the limbus finely cross-marked or serrate. (Plate **63**, fig. 6). The neuropodial setae of the anterior division are composite. The shaft ends distally in a socket of intermediate type, one edge rising considerably higher than the opposite one. The end-piece is long and varies much in size. It has a finely pointed, curved tip and is narrowly limbate along one side, the limbus being finely cross-striate, or vaguely serrate, as in those of the notopodial setae. (Plate **64**, fig. 1). There are thus three distinctly marked types of setae, two represented in the notopodia and neuropodia respectively of the anterior parapodia, and one represented in the parapodia of the posterior division. (Plate **63**, fig. 7).

The proboscis is wholly retracted, and, as it is thought best not to dissect the single specimen at this time the armature is not described,— and it is likely to have been lost under any conditions.

Locality. Gilbert Islands: off Arhno reef. Taken at surface by night light. One male. 24 January, 1900.

This form has colorless, semitransparent tissues similar to those of most other pelagic annelids. The uniformity in the characters of the simple setae of the posterior region, with the contrasting character between notopodials and neuropodials of the anterior region, are, perhaps, the most distinctive of the outer structural features.

Hemipodus Quatrefages.

Hist. nat. annelés, 1865, 2, p. 194; Arwidsson, Bergens mus. aarsbog, 1908, no. 11, p. 27.
Hemipodia Kinberg, Öfver K. vet. akad. Förh., 1865, no. 4, p. 245.

Hemipodus mexicanus, sp. nov.

Plate **63**, fig. 2, 3.

The general color at present is dusky grey-brown, with a somewhat darker middorsal line evident in parts. The parapodia are lighter, more yellowish, and the setae are colorless.

The type is incomplete caudally. In its present condition it is about 29 mm. long and counts nearly fifty-five somites, the precise number not being determinable because of the worn and frayed condition of the posterior region. The greatest width, which is a little in front of the middle of the fragment, is 2.8 mm. From this region the body narrows conspicuously both cephalad and caudad, the posterior narrow region being more slender and longer.

The prostomium has its base sunk into the anterior end of the body, than which it is very much more slender. It is slenderly conical, with the distal end curving somewhat ventrad. Because of the insinking of the head in the type the precise number of annuli cannot be satisfactorily determined, but it seems to be eight or more. The tentacles are colorless and small, much less than the median diameter of the prostomium.

The somites are strongly convex both dorsally and ventrally, the transverse diameter not much exceeding the dorsoventral one. There is no distinct neural groove, though slight furrows set off a midventral neural region. All somites, at least of the anterior and median regions, distinctly three-ringed.

The parapodia at the anterior end are situated clearly below the middle level of the sides, rising higher caudad. The first two pairs in the type are directed forwards, the others sublaterad. Parapodia are uniramous, short, and subcylindrical. Each at the distal end with two presetal ligulae, these slenderly cylindroconical, long, contiguous at base, with the dorsal one a little longer than the ventral. The postsetal ligula is single, proximally broad, but much shorter than the presetal ones. The neurocirrus is situated on the ventral surface near the middle of the parapodium in the anterior ones, further proximad caudad; it is conically pointed and short, in no case exceeding the tip of the postsetal process and in most falling clearly short of attaining this. The dorsal cirri are situated on the side of the somites considerably above the bases of the parapodia; they are very small cylindrical tubercles, almost abortive. (Plate **63**, fig. 2).

The setae are mostly compound. The shafts of these are slender, with the sockets moderately enlarged, intermediate in type, though in some asymmetry may be considerable. In these the blade is long and slenderly acuminate, with the tip long and fine, and bears along one side a series of long fine scales or teeth, which are usually closely arranged but in some appear farther apart. (Plate **63**, fig. 3). A few simple setae occur in some of the fascicles but could not be detected in others. They are long, with finely acute tips, and are obscurely minutely roughened.

The proboscis is wholly retracted.

LOCALITY. Gulf of California: Sta. 3437 (lat. 27° 39′ 40″ N., long. 111° 0′ 30″ W.). Depth 628 fms. Bottom of brown mud with black specks. Bottom temp. 40° F. 23 April, 1891. One specimen.

Among other features characterized by the abortive notocirri and the two long, subcylindrical, presetal ligulae of the parapodia.

GLYCERA Savigny.

Descript. Egypte. Hist. nat., 1809 [= 1822], **1**, pt. 3, p. 12, 36.
Rhynchobolus CLAPARÈDE, Annélides Chétop. Golfe Naples, 1868, p. 182.
Euglycera VERRILL, Trans. Conn. acad. sci., 1882, **4**, p. 287.
Glycera ARWIDSSON, Bergens mus. aarbog, 1908, no. 11, p. 5; McINTOSH, British annelids, 1910, **2**, pt. 2, p. 477.

GLYCERA DIBRANCHIATA Ehlers.

Borstenwürmer, 1868, p. 670, pl. 24, fig. 1, 3–8, 10–28.
Rhynchobolus dibranchiatus VERRILL, Invert. Vineyard Sound, 1873, p. 596, pl. 10, f. 45, 46; Amer. journ. sci., 1874, ser. 3, **7**, p. 132; Proc. Amer. assoc. adv. sci., 1874, p. 370, 373; WEBSTER, Rept. N. Y. state mus., 1879, **32**, p. 17.
Euglycera dibranchiata, VERRILL, Trans. Conn. acad. sci., 1882, **4**, p. 287; WEBSTER & BENEDICT, Rept. U. S. Comm. fish., 1885, p. 726.

LOCALITY. Atlantic Coast: Between Cape Hatteras and Nantucket. Sta. 2305 (lat. 35° 23′ N., long. 74° 51′ 30″ W.). Depth 58 fms. Bottom of fine grey and black sand. 21 October, 1884. One complete specimen.

GLYCERA PROFUNDI, sp. nov.[1]

Plate **64**, fig. 2–6.

Color of the preserved type brown, in part of slight reddish cast, the venter with a pale median longitudinal stripe; the parapodia yellow; prostomium yellow at tip.

[1] profundum, depth.

The body is widest at about the eighteenth setigerous segment from where it narrows continuously caudad. The body is nearly cylindrical, a little less convex ventrally than dorsally. The greatest width of the type, exclusive of parapodia, is 4.5 mm.; including parapodia and setae, 8.5 mm.

The prostomium consists of the usual broad basal portion, which is strongly transversely wrinkled, and the slender subconical smooth portion. The basal portion is proportionately short. The conical process is somewhat compressed dorsoventrally, is marked by a distinct median longitudinal furrow both above and below, and is divided transversely into eight or nine rings. (Plate 64, fig. 2).

All segments are very short, and the anterior ones especially are closely crowded at widest region, being eight or nine times wider than long. All segments are conspicuously triannulate. The annuli are all equal in length, or, in the anterior region, the median, parapodia-bearing, one of each somite is somewhat wider laterally than the others.

The notocirri are inserted on the sides of the body above bases of the parapodia. They are very small, whitish, cylindrical papillae, which are absent from the first two setigerous segments. The first two parapodia, or properly, the neuropodia, are situated high on the body at the sides of the mouth. They are small. The first two parapodia lack neurocirri; they are small and subconical, presenting a flattened, distally rounded, apical lip, which is slightly notched but not divided. The immediately succeeding parapodia show a slight, rounded postsetal lip and a large presetal lip divided into a much stouter and shorter, basally thick, ventral division acuminate at tip, and a more slender, pointed dorsal lobe. The neurocirrus, attached to the middle of the ventral surface and not reaching the end of the neuropodium by a considerable distance, is present and is thick at base and strongly pointed distally. (Plate 64, fig. 3). In proceeding caudad the parapodia become longer and proportionately more slender and cylindrical. The dorsal presetal lobe becomes transformed into an unbranched gill, being thin and elongate, with the foliaceous base reduced in relative size, but not or but little exceeding the ventral division, which becomes of more uniform width and not especially thickened proximally. The dorsal ligulate gill is attached on the dorsal surface near the distal end of the parapodium, and is suberect. The neurocirrus is developed into a ventral gill similar in structure, appearance, and size to the dorsal one, which does not reach the tip of the postsetal lobe. (Plate 64, fig. 4, 6).

Acicula pale yellowish, transparent, two in number, of which the ventral is much the stouter. The setae of the parapodia, excepting first two, as usual, in three groups. Of these the dorsal consists of simple bristles, the others of compound ones of the usual form. The socket of the compound setae is slightly asymmetrical, being deeper toward one side than the other; the blade is moderately short, and slenderly acuminate, with the surface and edges apparently wholly smooth.

The proboscis in the type is only partly extended, and its detailed structure is not described. The extended portion is about 8 mm. long and 3 mm. thick at distal end.

Locality. Gulf of California: Sta. 3435 (lat. 26° 48″ N., long. 110° 45′ 20″ W.). Depth 859 fms. Bottom of brown mud with black specks. One specimen, of which the caudal end is missing, taken 22 April, 1891.

This species in general structure suggests *G. branchiopoda* Moore which has been recorded at depths varying from 222 to 1,400 fms. at localities from Monterey Bay to the lat. of Cape Calnett, Lower California. Both these species occur at depths much greater than usual in the family. *G. profundi* is a larger and much stouter species, which reaches its maximum width farther cephalad; the prostomium has nine rings in its distal portion instead of but seven, and the proportions are apparently considerably different; the caudal ring of the somite is not largest; the first two parapodia differ in lacking any conspicuous, pointed, presetal lobe; the other parapodia also differ in structure and proportions, the neurocirrus, *e.g.*, or ventral gill, of most segments being relatively much shorter, never attaining the end of the parapodium, whereas in *branchiopoda* it decidedly exceeds it; the dorsal gill is also relatively shorter. The blade of the compound setae appears to lack denticulations, etc.

GLYCERA FUNDICOLA, sp. nov.

The type, which is caudally incomplete and is in two pieces, is a robust specimen of uniform, light yellow color.

The prostomial process is broadly conical, being rather wider across base than long, compressed dorsoventrally, the depth being much less than the width. Composed of seven distinct rings. Tentacles slenderly subulate.

Anterior somites short and closely crowded as usual, those of the middle and posterior region much longer. All very distinctly biannulate.

The parapodia are long, moderately compressed in anterocaudal direction, more strongly so distally. Each at the end presents four lobes, of which the two presetal are long, slenderly conical and almost subulate, equal, while the posterior ones are only slight, broadly rounded lips separated by a shallow emargination. Neurocirri attached on ventral surface well distad of middle of parapodium, stout at base, but strongly tapered distad like the presetal lobe, which is a little smaller. The notocirrus is attached on the side of the segment a little above the base of the parapodium. It is a pale, short, subcyclindrical, distally rounded papilla. No branchiae or branchiform organs are present. On the fifth parapodia the dorsal presetal lobe is scarcely evident, though normally developed on the sixth, while on the anterior four pairs it is quite absent, leaving a single, pointed, presetal lobe. The first two pairs of parapodia much reduced, as usual; both retain the neurocirrus.

Acicula two in each parapodium, with the notopodial the stouter; tapered to rather fine, curving tips; pale. The composite neuropodial setae are characterized by their peculiar sockets; the sides of the socket are long and flare widely apart, the tips curving ectad away from the base of the terminal piece.

The eight anterior segments present in the type have a length of 50 mm. Greatest width, exclusive of parapodia, 4 mm.

LOCALITY. Peru: 111 miles N. W. of Aguja Point. Sta. 4651 (lat. 5° 42′ S., long. 83° W.). Depth 2,222 fms. Bottom of fine sticky gray mud. Bottom temp. 34.5° F. 11 November, 1904.

This species appears to come from the greatest depth recorded for a glycerid.

ARICIIDAE.

These are typically elongate polychaetes, in which the body is commonly obviously flattened dorsally and convex ventrally; pointed at both ends, but more strongly so caudad. Somites short. Body very fragile. Commonly of a rose-tint.

The prostomium is in the form of a cone devoid of processes. Eyes may be either present or absent.

Peristomium without processes, achaetous.

Parapodia normally subdorsal in position; often dorsolateral anteriorly and dorsal in position posteriorly. Biramous. Rows of tubercles on caudal surface of the anterior pairs often present (Aricia). Often dividing the body into two regions by differences in their form and in the character of the setae borne.

Setae simple, normally of several types, always including an elongate, distally acute form which is strongly cross-ridged, appearing to be annulated or camerated. Stouter, spine-like or clavate, camerated forms may also occur, these being in the neuropodia and confined to the anterior region.

Branchiae present, these ligulate in form and dorsal in position. They begin on one of the first twenty somites as rudimentary processes, increasing gradually in size and usually continuing to near the caudal end; often forming two more or less distinct groups.

Anal cirri two or four, usually long.

Proboscis short, unarmed, distally simply frilled, or sometimes more distinctly digitate, in some not evaginable.

Larvae non-pelagic.

Otocysts, such as occur, among polychaetous annelids, also in the Arenicolidae, Terebellidae, and Sabellidae, are found in some ariciids. When found in this family they occur on a limited number of the anterior somites. Each is an invagination ordinarily close to the notocirrus. Another type of sense-organ, the more widely occurring "lateral ciliated organs" or "lateral line organs," are located farther ventrad and are to be found in all regions of the body.[1]

Ariciids occur from the littoral zone down to considerable depths. *Aricia norvegica* Sars was dredged by the CHALLENGER from 1,340 fathoms. They frequent mud, and sand more or less mixed with mud. They live upon small organisms and often ingest much foreign matter, their intestines frequently containing sand and debris of shells, Foraminifera, etc. (Gravier, Nouv. arch. Mus. hist. nat., 1908, ser. 4, **10**, p. 167).

Key to Genera.

a. Neuropodium with a laminate, festooned border, opposite ones often joined across the venter. *Aricia* Audouin and Milne Edwards.

aa. Neuropodium not so, simply bifid or entire.

b. Prostomium anteriorly rounded, button-shaped........................*Nainereis* Blainville.

bb. Prostomium pointed.

c. On some somites of the posterior division each branchia with five or more filaments forming a transverse series and leaving only a narrow middorsal region naked; peristomium strongly reduced ventrally..*Branchethus*, gen. nov.

cc. Branchiae ligulate, never with simple branches in transverse series; peristomium not reduced ventrally...*Scoloplos* Blainville.

NAINEREIS Blainville.

Dict. sci. nat., 1828, **57**, p. 491.

Naidonereis MALMGREN, Annulata Polychaeta, 1867, p. 73; EHLERS, Zeitsch. wiss. zool., 1875, **25**, p. 59; McINTOSH, Ann. mag. nat. hist., 1905, ser. 7, **15**, p. 48.

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[1] For an excellent account of the occurrence and structure of otocysts in polychaetes see P. Fauvel, Recherches sur les Otocystes des Annélides Polychètes, Ann. sci. nat., 1907, ser. 9, **6**, p. 1–149, 3 plates.

Nainereis MESNIL and CAULLERY, Bull. scientif. 1898, **31**, p. 143.
Nainereis McINTOSH, British annelids, 1910, **2**, pt. 2, p. 516.
Theodisca F. MÜLLER, Archiv. naturg., 1857, **24**, p. 1.

NAINEREIS RETUSICEPS, sp. nov.[1]

Plate **65**, fig. 3–5.

The general color is yellow, of a slightly brownish cast.

The body is moderately long and slender, depressed, but little, convex above and decidedly more strongly arched below, not grooved. At the caudal end the body is flattened, thin and wedge-shaped. It is also somewhat similarly flattened at the anterior end (inclusive of peristomium). The body is narrow in the region just in front of the middle, from where it widens distinctly both cephalad and caudad. The total length of the type is about 18 mm. and the width in the anterior broad region is 1.9 mm., exclusive of the parapodia, and in the broadest region caudad of the middle, about 2 mm. There are about one hundred and sixty-five very short and closely crowded somites.

The prostomium is wide and rather short, anteriorly bluntly rounded. It is flattened dorsoventrally, deepest at base. There is a shallow median longitudinal sulcus above. At the middle of the length there is a shallow transverse furrow which on the sides is deeper, forming conspicuous notches, in each of which the nuchal organ lies. The median longitudinal furrow extends around the anterior end and continues caudad beneath as a wider furrow extending to the mouth.

There are no eyes or appendages.

The peristomial region is double, the two rings, wholly achaetous and without appendages, are less strongly separated above but are very distinct laterally and ventrally. Together they narrow cephalad like the frustrum of a cone. The two together are above shorter than the prostomium and longer than the first setigerous somite, though decidedly less than twice so. On the ventral side the anterior ring is incomplete, each end lying at the lateral border of the mouth, and lying partly in an excavation of the posterior ring, which extends forward between the ends of the anterior one to limit the mouth on its caudal side. This median region of the second ring, the labium, is straight anteriorly and is crossed longitudinally by fine sulci, which at the sides are somewhat oblique.

The metastomial somites are all extremely short, in the widest anterior region (*i.e.*, near sixteenth somite) being sixteen times as wide as long. The anus is terminal and is surrounded by a ring of tubercles; cirri on the ventral side as very short subconical processes.

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[1] retusus, blunt, ceps, head.

The parapodia throughout the length of the body are located high on the sides, near the dorsal level. All the parapodia are distinctly biramous, with the branches well separated. The parapodia vary somewhat in form in different regions. In the anterior region each branch consists of a low, rounded setigerous eminence with a conspicuous postsetal process. The postsetal process of the notopodium is subconical, more or less flattened in the anteroposterior direction and longitudinally furrowed or concave at base on the setal side; the tip is prolonged and acute. The postsetal process of the neuropodium is similar to that of the notopodium, but is shorter, broader at the base, being prolonged at the base on the ventral side, and is rather more strongly flattened. (Plate 65, fig. 3). In the posterior region the branches of the parapodia proper have become stouter and more elevated, the postsetal process being relatively smaller and more slender and cylindrical, cirriform, often appearing only as short, postsetal points, and the setigerous process proper often pointed and nearly equally elevated.

In the anterior region the setae are of two types, both simple. There are the long, conspicuously acuminate and slenderly tipped capillary setae having the characteristic camerated, or grated, structure, with serrated margin. The cameration is absent proximally and over the slender tips. This type is found exclusively in the notopodium, and occurs as well in the neuropodium in a fascia much larger than that of the notopodium. (Plate 65, fig. 5). Besides these there are in the neuropodium arranged commonly in a bow on the ventral side of the circumference of the fascia, a number (often eight or ten) of much stouter, spine-like setae. The greater part of each of these is buried, the free portion being much shorter than that of the capillary setae. The free part is weakly sigmoid, presenting a longer proximal curve with convexity dorsad and a short distal curve with convexity ventrad. It narrows distally, the distal end being acute. Each shows a fine, medullary, longitudinal fibrillation and, along the dorsal half only, a transverse ridging, or cameration. (Plate 65, fig. 4). The acicula are stout and colorless.

Branchiae begin on the sixth somite. They are situated on the dorsum, each a little mesad of a corresponding notopodium. All are simple, and a single pair is present on each branchiferous somite. They are all flattened in the cephalocaudal direction, and narrow from the base to an acute tip. The first few are shorter than the notopodial postsetal process; but they increase in length and breadth in going caudad and in the middle region exceed the postsetal processes. In this region, however, a branchia laid transversely does not wholly attain the base of the branchia of the opposite side. The branchiae continue to the caudal end, but in the caudal region have become much reduced, more conical in form, and smaller than the postsetal processes. The branchiae in all cases are strictly entire, none showing any such slight tendency to bifurcate at the tip as noted by Ehlers for *Scoloplos cylindrifer*.

LOCALITY. Paumotu Islands: Rangiroa Island, Mohican Reef. 23 September, 1899. One specimen.

The form of body in this species is characteristic, widening from a little in front of the middle both cephalad and caudad, somewhat as described for *M. longa* Moore. From this form, however, it differs decidedly in various other structural details, such as the proportionately longer prostomium, in having the peristomium clearly shorter than the prostomium, in having the branchiae begin on somite VI instead of on X to XII, the less filiform branchiae, etc.

BRANCHETHUS, gen. nov.[1]

Prostomium in the form of a truncate cone with a more flexible process or palpoid on the truncate surface, nearly as in Scoloplos, without eyes or tentacles.

Peristomium long above, but narrowing strongly ventrad and almost obliterated in the midventral region. Proboscis short, and wholly smooth.

Body elongate, much broader in anterior third than caudally; strongly flattened above, convex ventrally.

Body divided into two regions strictly distinct in the character of the parapodia. In the anterior division the parapodia more lateral in position, with neuropodia much elongated in the dorsoventral direction and bearing very numerous, special, stout setae and longer, finer, capillary setae, both of which are strongly annulated, the notopodium bearing setae of the finer type only. Posterior border of neuropodium not festooned, but in the middle region bearing a short, foliaceous, distinctly rounded postsetal flap. Parapodia of the second and major division of the body with neuropodia not elongate dorsoventrally; more slender and proportionately longer, and bearing setae of the long, fine kind only. The somites of the first division clearly longer than those of the second.

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[1] βράγχια gills, ἦθος, character.

Branchiae beginning on somite VI. The first ones small, simple, and ligulate. In the posterior part of the anterior division some become two-branched. In the anterior portion of the posterior division the branchia on each side of each somite consisting of a transverse series of five or more long, cylindrical filaments arising contiguously and from a common low base. In the posterior region the branchiae are again simple, one pair on each somite, and much reduced.

GENOTYPE.— *B. latum*, sp. nov.

This genus is nearest Scolopos from which it is most readily distinguished by the highly and specially developed condition of the branchiae of the middle region of the body and by the form of the peristomium, which in the second genus is in the form of a truncate cone with no such great reduction on the ventral side as occurs in Branchethus.

BRANCHETHUS LATUM, sp. nov.[1]

Plate **64**, fig. 7–11; Plate **65**, fig. 1, 2.

The body itself is brown throughout and with no special markings excepting on the sides of the peristomium, which are blackish or deep purplish. The parapodia are paler, yellowish, and the setae are colorless, or very dilute, transparent yellow. The branchiae are more or less tinged with purple, the seriate ones of the middle somite appearing darkest, the most posterior ones lightest. The tips of the neuropodia and its processes are in the middle region also in part marked with purplish. The notopodia are also marked with some distal purplish areas. The postsetal processes of notopodia commonly have a purplish spot on basal region, and those of neuropodia above at their bases.

The body is very broad anteriorly, the greatest width being attained near the thirteenth somite, from where the body narrows strongly cephalad, and, beginning near the caudal end of anterior division of body, at first strongly and then more gradually caudad, the posterior region becoming rather slender. The dorsum is flat throughout. It shows a clearly impressed, median longitudinal furrow. The venter is considerably flattened also in the anterior region, where the depth of the body in proportion to the width is very small, while posteriorly it becomes strongly convex. There is a distinct median longitudinal neural furrow, which becomes more sharply defined in the posterior region. Neither of the types is complete posteriorly. One, having a total length of 47 mm., retains sixty-four somites. Its maximum width, exclusive of the parapodia, is about 8 mm. The other specimen is 80 mm. long, has a maximum width of 7.5 mm., and consists at present of nearly 126 somites. In both specimens the first division of the body embraces twenty somites.

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[1] latus, broad.

The prostomium caudally is a little expanded. The main portion of the prostomium is strongly subconical, distally truncate, the distal surface at present showing a softer rounded eminence, which is probably contracted from a palpoid article such as is present in Scaloplos, the types having been at some time, it appears, partly dry. Relatively to the succeeding region the prostomium is very small, appearing as a mere tubercle on the anterior face. No eyes are present.

The peristomium above is much longer than the second somite, with the anterior margin nearly straight. The anterior margin on each side is a little concave and curves obliquely caudad of ventrad, the peristomium then becoming narrower and incomplete at the middle of the venter, on each side of the venter ending in an acute angle, the two arms leaving a very obtuse reentrant angle between them which is filled by the soft border of the proboscis. Above on each side at the anterior border is a conspicuous nuchal groove or pit.

The proboscis is very short, much broader than long, and is wholly free from papillae, wrinkles, or other unevenness.

The first metastomial somite, like the peristomium, narrows conspicuously ventrad but less strongly so than the latter. In one specimen, at least, it shows a slight median incision in the anterior border. The succeeding somites are not narrower ventrally than dorsally. They increase in length to somite V or VI, after which they remain of essentially uniform width to the end of the anterior division of the body. At the widest part of the body the somites are near five and a fourth times wider than long. The segments in the posterior region of the anterior division and the anterior region of the posterior show a tendency, particularly above, to be bent angularly a little forward at the middle, this being more pronounced in one type than in the other. In the posterior division the somites are much shorter, being only from one half to one third as long as those of the anterior division. They are shortest in a region covering about twelve somites beginning three or five somites behind the anterior end of the division. In the median dorsal region of each somite, in the median groove, there is in each somite of the second division a low, short ridge or rounded elevation on the anterior side of the somite, this often broken into two tubercles, and commonly purplish in color. In the more posterior somites this ridge is more elongate and lacks any purplish pigment.

The parapodia of the anterior division are all strongly developed, with both branches conspicuous. They are reduced in size gradually at the anterior end, but in all cases are large and distinct. The neuropodia are strongly elongate in the dorsoventral direction, the distal end linear, or linear oblong, in outline, the remaining part increasing strongly in thickness proximad. They decrease in size both ways from near the middle of the series. The caudal distal edge is slightly raised and, ventrad of its middle, is prolonged into a pointed lobe which is subconical, with thick base, or in the more posterior ones becomes more or less flattened and broader, and in the most anterior ones much more slender. The notopodia of the anterior division are much less stout than the neuropodia, from which they are separated distally by a deep and wide cleft. Each bears a large and very conspicuous postsetal lobe, which is broadly subconical, being proximally as broad as the notopodium proper, and distally prolonged into a slender tip with incurving sides and acute tip. Each postsetal process has a purplish spot on its middle. In the anterior parapodia of the posterior division the neuropodia are abruptly much smaller than those of the anterior division, being still, however, stouter than the notopodia. Caudad the branches become gradually larger and more slender, the neuropodia exceeding the notopodia, with the cleft between very deep. In the most caudal region of the longer fragment the cleft between the branches becomes very shallow and the notopodia appear more tubercle-like. The parapodia in this region are much flattened in the anteroposterior direction and extend out dorsad and ventrad at the base. No true cirri occur.

Nearly all the setae of the posterior division of the body have been lost. Those detected are all of a very fine, long, capillary type, with strongly marked cross-striation, or annulation. Those of the notopodia of the anterior parapodia are of the same type. (Plate 65, fig. 2). In the anterior neuropodia, setae of this type occur along with numerous setae of a much stouter, shorter, special type, the setae being very numerous and densely arranged in vertical series. The stout, blade-like setae all have the free portions strongly curved and acutely tipped; the tip curves slightly in the reverse direction. The setae are strongly and closely camerated, or cross-striate, like the finer and more flexible capillary setae. (Plate 65, fig. 1).

The branchiae begin on the sixth somite. The first seven branchiferous somites have each a single pair of simple branchia, each of which is inserted on the dorsum nearer to the corresponding notopodium than to the middorsal line. These branchiae are flattened and are acutely acuminate. (Plate **64**, fig. 7). Each is purplish proximally and less strongly so along each side to near the tip. They increase in length caudad, but in no case when laid transversely do they reach the middorsal line. The eighth branchiferous somite in both of the type-specimens has a simple branchia on the right side, while that on the left side is double, two equivalent branches arising from an almost obsolete common base. On the ninth and following somites the branchiae each presents two equivalent branches, contiguous or united at the very base, as far back as the thirteenth branchiferous somite, inclusive, in one specimen and the fifteenth in the other. (Plate **64**, fig. 8). In the first case, on the thirteenth, fourteenth, and fifteenth branchiferous somites the branchiae have three branches. In the second specimen, on the last somite of the division (fifteenth branchiferous) the left branchia has three divisions, and the right one four. In the anterior region of the posterior division of the body the branchiae are much more strongly developed, the number of filaments rising to as many as nine. All the filaments in each lateral group are arranged in a straight transverse series. (Plate **64**, fig. 9). The space between the series of opposite sides in all cases exceeds the length of the series, but the latter is decidedly greater than the distance from the most mesal filament to the middorsal line. The filaments in this region are much longer than in the anterior region. Most filaments are lost; but one at the mesal end of a series was found which reached across to the ectal end of the opposite series. In going farther caudad the number of filaments in each group and their length again decreases. In the most posterior region of the longer type the branchiae have become again all simple, with a single pair to each somite, these short and without purplish pigment. (Plate **64**, fig. 10, 11).

LOCALITY. Off Panama: Sta. 3354 (lat. 7° 09′ 45″ N., long. 80° 50′ W.). Depth 322 fms. Bottom of green mud. Bottom temp. 46° F. 23 February, 1891. Two specimens.

PARAONIDAE.

Certain genera, namely Aricidia and its allies, that have commonly been placed under the Ariciidae are more properly to be placed in a separate family, as was first pointed out by Mesnil and Caullery (Bull. scient., 1898, **31**, p. 126).

Since Levinsenia Mesnil (1897) has been shown by Cerruti (Mitth. Zool. sta. Neapel, 1909, **19**, p. 459–512, pl. 18, 19) to be a synonym of Paraonis Grube (1873), the family name is by that author properly changed to Paraonidae. A conspicuous structural difference between Ariciidae and Paraonidae lies in the complete lack of cross-ridged, or camerated, setae in the latter. All have a slight sensory papilla at the apex of the prostomium and may or may not have also a tentacle. Aricidiopsis Johnson is synonymous with Aricidia Webster.

Key to Genera.

a. With no tentacle.
  b. With specially modified stouter setae or spines, often as hooded crochets, occurring only in the posterior neuropodia...*Paraonis* Grube.
  bb. Such modified setae occurring only in the posterior notopodia...........*Paraonides* Cerruti.
aa. A tentacle present, dorsal in position.
  b. Specially modified stout setae or spines occurring only in the posterior neuropodia. *Aricidia* Webster.
  bb. Such setae occurring only in the posterior notopodia, these setae acicular in character. *Cirrophorus* Ehlers.

GONIADIDAE.

These are forms of medium or large size in which the body is elongate, slender, and somewhat depressed, and is composed of numerous somites. Colors normally weak and uniform; sometimes pinkish from the blood, which, as in the Glyceridae, contains large corpuscles in which haemoglobin is present; some show a different color, such as a greenish tinge, when carrying ripe ova.

The prostomium slenderly conical and divided into from seven to eleven annuli, of which the most anterior bears four small tentacles. Eyes either present or absent.

Nephridia with inner end closed and with solenocytes. A genital funnel opening into nephridial duct at time of ripening of sex products.

Parapodia of anterior region of the body uniramous, those of the middle and posterior regions biramous. Neurocirri conical. Notocirri more or less flattened.

Setae of the uniramous parapodia simple. In the biramous parapodia the notopodial setae are simple, the neuropodial composite.

Anal cirri two.

The proboscis is long. As in the Glyceridae it bears at its distal end a circle of normally eighteen papillae, of which one lies in the middorsal and one in the midventral line. The chitinous pieces of the armature are numerous, consisting of few, large hooks, or toothed jaws proper, and more numerous, smaller horny jaws or paragnatha, each of which is normally composed of two pieces. The jaws are arranged in various series, mostly two to five in number.

In distribution and habits very similar to the Glyceridae with which they form a natural and compact group, which I believe it advantageous to designate as a superfamily, the Glyceroidea.

Key to Genera.

a. An insensible transition from the uniramous parapodia to the biramous; with no chitinous pieces on the sides of the proboscis . . . . *Glycinde* F. Müller.

aa. Two regions of body clearly distinct in the character of their parapodia; chitinous pieces in adults on each side of proboscis, these V-shaped and joined together. *Goniada* Audouin and Milne Edwards.

Epicaste Kinberg (1865) and Eone Malmgren (1865) are synonyms of Glycinde F. Müller.

GONIADA Audouin and Milne Edwards.

Hist. nat. litt. France. Annélides, 1834, **2**, p. 244; QUATREFAGES, Hist. nat. annelés, 1865, **2**, p. 191; ARWIDSSON, Bergens mus. aarbog, 1908, no. 11, p. 34; MCINTOSH, British annelids, 1910, **2**, pt. 2, p. 462.

Ophioglycera VERRILL, Proc. U. S. N. M., 1885, **8**, p. 436.

GONIADA EREMITA Audouin and Milne Edwards.

Hist. nat. litt. France. Annélides, 1834, **2**, p. 247, pl. 6A, fig. 1–4; QUATREFAGES, Hist. nat. annelés, 1865, **2**, p. 191; EHLERS, Borstenwürmer, 1868, p. 704, pl. 24, fig. 49–51; MCINTOSH, British annelids, 1910, **2**, pt. 2, p. 466.

LOCALITY. Georgia: off Savannah. Sta. 2419 (lat. 33° 34′ N., long. 76° 40′ 30″ W.). Depth 107 fms. Bottom of fine grey sand with black specks. Bottom temp. 60.3° F. 2 April, 1885. One incomplete specimen.

A species widespread, occurring on both sides of the Atlantic. On the American side it seems to be common in the more southern latitudes, but off the New England Coast it is rare as compared with the well-known *G. maculata* Oersted.

CHAETOPTERIDAE.

In this highly specialized family the body is divided into either two or three distinct regions, of which the sharply defined anterior one is composed usually of from nine to fourteen somites. All live in tubes of parchment-like texture, to which they are rather strictly confined and adapted.

The prostomium is small and often inconspicuous. It is without appendages, but usually bears a pair of eyes.

The peristomium forms a collar which often almost completely encloses the prostomium, though sometimes incomplete above, so as to leave the prostomium clearly visible. It bears a pair of often long and conspicuous grooved tentacles. It may or may not bear a second pair of shorter processes, often also spoken of as tentacles, but really representing modified parapodia in which traces of setae may sometimes be detected.

The somites of the anterior division of the body are uniform. They are characterized by having their parapodia all strictly uniramous, the neuropodia not being developed. In the remaining part of the body the parapodia are biramous. Each neuropodium forms a bifid, or double, ridge, or torus, on which the uncini are arranged in several series. From differences in the character of the notopodia a median region in most forms is clearly distinguishable from a longer posterior one, the notopodia of the median region often being enlarged and highly modified into fin-like structures. The dorsal surface of the anterior region conspicuously flattened. Dorsally there is a markedly characteristic longitudinal median groove, which is ciliated and which may extend over the entire length of the body, or may be interrupted.

The thoracic setae in general are simple lanceolate or hastate forms. The fourth somite always bears one or more stouter setae of a special type. The neuropodia bear numerous seriate uncini which are serrate along their free, or distal, edges.

Autotomy and regeneration are frequent in the family. Thus, in *Chaetopterus pergamentaceus* Cuvier, as a result of unusual stimulus, autotomy takes place between the first and second somites of the median region, and may be followed by regeneration of a complete individual not only from the anterior fragment but also from the posterior one (See Gravier, Ann. sci. nat. Zool., 1899, ser. 9, **9**, p. 129, 155). Potts, according to a recent paper (Proc. Zool. soc. London, 1914, p. 955), has found autotomy to be a very frequent and apparently normal method of reproduction in *Phyllochaetopterus prolifica* Potts. This accounts for the occurrence in the same tube of a number of individuals, a phenomenon that had been previously noted by Claparède (Annélides Chétop. Golfe Naples, 1868) for the allied Mediterranean species, *P. socialis* Claparède.

The chaetopterids seem never to leave their parchment-like tubes, being among the most sedentary of the polychaetes. The tubes may be straight but commonly are more or less strongly bent into a V- or U-shape, or sometimes nearly into that of a figure 8. In some, if not all, species of Phyllochaetopterus, the tubes are branched, and may be interconnected in such a way as to form extensive creeping systems, the tubes in, *e.g.*, *P. socialis* forming dense masses, and in *P. anglica* Potts bundles of parallel divisions (Potts, *Op. cit.*, p. 984). A current of water is kept constantly flowing through the tube, primarily by means of the cilia lining the dorsal groove. From this respiratory current food-materials are secured. The securing of food is aided by the usually long tentacles which ordinarily are protruded from the mouth of the tube and are moved over the surrounding surface, sweeping up diatoms and other small organisms which are carried by the current formed by their ciliated grooves to the mouth of the tube into which they are drawn.[1]

These annelids occur between tide-marks and at moderate depths, though sometimes found in comparatively deep water.

Other animals sometimes occur in the tubes of the chaetopterids as commensals. Thus in tubes of *C. pergamentaceus* (*C. variopedatus*) have been found *Polynoe setossisima* Savigny, *Gattyana cirrhosa* (Pallas), and the polyzoan *Hypophorella chaetopteri* (Joyeux-Laffuie) (*Cf.* Archiv. zool., 1890, ser. 2, **8**, p. 335).

Key to Genera.

a. Body divided into three regions.
  b. Peristomium with a single pair of appendages (tentacles).
    c. Median region consisting of five somites of which the first bears separate fin-like notopodia and the others notopodia united across the dorsum to form conspicuous single fans or suckers. *Chaetopterus* Cuvier.
    cc. Median region consisting of two or three somites in which all the notopodia remain separate.
      d. Notopodia of median region bilobed and foliaceous................*Spiochaetopterus* Sars.
      dd. Notopodia of median region unilobed and conical..............*Mesochaetopterus* Potts.
  bb. Peristomium with a second pair of smaller tentaculiform appendages in addition to the ordinary tentacles. (Notopodia of middle region foliaceous and bilobed or multilobed). *Phyllochaetopterus* Grube.
aa. Body divided into but two regions.
  b. Notopodia of the posterior region all undivided.......................*Ranzanides*, nom. nov.[2]
  bb. Notopodia of the posterior region all two-lobed.........................*Telepsavus* Costa.

Synonymy of Genera.

The genus Tricoelia of Renier was established in 1848 with *T. variopedatus* as the type. But this species is identical with *pergamentaceus*, the type of Cuvier's Chaetopterus (1830). Some authors, however, have given precedence to Renier's species, apparently under the assumption that Renier's Prospetto dei Vermi (1804) was published and distributed. If the species *variopedatus* is given precedence over *pergamentaceus*, then Tricoelia is valid and must be used instead of Chaetopterus and the name of the family must be Tricoeliidae. McIntosh adopts *variopedatus* but recognizes 1848 as the date of publication, and in the synonymy lists *pergamentaceus* with 1830 as the date, a procedure difficult to justify. While some pages of Renier's work were apparently printed, there is no evidence that his incomplete work was ever distributed, and in the literature no definite citations to it are to be found.

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[1] For the more complicated feeding methods see Enders, Life history and habits of *Chaetopterus variopedatus*, Journ. morph., 1909, **20**, p. 479–431.

[2] *Pro Ranzania* Claparède (1875), *nec* Bonaparte (1841), *nec* Bertoloni (1855).

The type of Grube's genus Phyllochaetopterus, *gracilis*, has not been identified with certainty, I believe, since the time of its first description. Grube attributes but a single pair of tentacular appendages to his form and describes these as short. It is generally assumed that Grube's specimens had lost the true tentacles. As the genus is now accepted, two pairs of appendages are present on the peristomium; but there must remain some doubt until *gracilis* has been reidentified and fully described, as to whether that species is really congeneric with the more recently described ones.

CHAETOPTERUS Cuvier.

Règne anim., ed. 3, 1830, **3**, p. 208.
Tricoelia RENIER, Osserv. postume, 1848, p. 35.

CHAETOPTERUS PERGAMENTACEUS, Cuvier.

Règne animal, ed. 3, 1830, **3**, p. 208.
Chaetopterus norvegicus SARS, Beskr. og lagtt., 1835, p. 54, pl. 11, fig. 29a–29h.
Tricoelia variopedata RENIER, Osserv. postume, 1848, p. 35, pl. 8.
Chaetopterus sarsii SARS, Nyt mag. naturv., 1863, p. 302.
Chaetopterus insignis BAIRD, Trans. Linn. soc. London, 1864, **24**, p. 477, pl. 49, fig. 1–8.
Chaetopterus valencinii QUATREFAGES, Hist. nat. annelés, 1865, **2**, p. 210, pl. 12, f. 1.
Chaetopterus leuckartii QUATREFAGES, *Ibid.*, 1865, **2**, p. 216.
Chaetopterus quatrefagesii JOURDAN, Not. zool. anat. Chaetop., 1869.
Chaetopterus variopedatus MCINTOSH, Brit. annelids, 1915, **3**, pt. 1, p. 121.

This interesting annelid appears to have a very wide distribution. Described originally from the Caribbean Sea, it has since been recorded under various specific names from Norway and Sweden, the British Islands, and the coasts of France, Mediterranean Sea, Red Sea, coasts of New England and North Carolina, Strait of Magellan, and Chile. I am unable to find reliable differences between specimens collected at Panama and those from the Atlantic side or between these and the European forms. *C. pergamentaceus* and *norvegicus* both have priority over *variopedatus*, the most commonly used name.

LOCALITY. Panama. March, 1891. Several specimens and a number of tubes.

The membranous tubes are of the usual form and proportions. They were evidently found buried in shell-beds, as numerous fragments of shells closely cover the walls of the tubes, from which they stand out horizontally.

SPIONIDAE.

In the members of this family the body, as a rule, is small, cylindrical, and translucent, of varied and often bright colors, with the somites numerous.

The prostomium is small, reduced to a narrow dorsal band, which may extend as far caudad as the fourth somite, though in some cases reaching only the second. Anteriorly it may be entire, or it may be somewhat incised, and thus with two short processes, but with no true tentacles. The eyes are most commonly four, sometimes more and at others wholly missing. Two elongate, tentaculiform, very contractile, and in most easily lost, palpi form a very characteristic feature of this family together with the Disomididae and Apisthobranchidae (Spionoidea).

Peristomium without processes or setae. Proboscis short and simple, scarcely truly differentiated, but in some, at least, protrusible.

Parapodia mostly biramous, both notopodium and neuropodium with a distinct lamella caudad of the setigerous branch, which bears two transverse series of setae.

Setae all simple, of two principal kinds: — finer, limbate, capillary, setae and stout, hooded crochets of a type similar to those occurring in the Capitellidae and some Leodicidae. In addition, special, pale-like spines may occur on the fifth setigerous somite.

Branchiae simple, ligulate or cirriform, of variable number and position or in some wholly absent, often completely fused with the dorsal lamella.

Anus more or less clearly dorsal in position, surrounded with cirri, papillae, or a cup-like rim.

These forms are almost strictly confined to the littoral region, one species, *Nerine foliosa* Sars, however, having been dredged from a depth of 725 fathoms. The larvae are widely distributed as pelagic forms, a considerable number of which have been described, though in most cases without definite reference to the corresponding adults. The period of pelagic life seems to be long. Some species live on sandy bottoms of varied character, in beds of mollusc shells, among rocks, and among Algae; others make tubes of sand or calcareous particles. They feed upon diatoms, various other Algae, and such animal forms as small Mollusca. They have marked powers of regeneration, renewing readily the anterior as well as the posterior region of the body.[1]

The littoral habits of these annelids accounts for the fact that but a single species is represented in the collections of the ALBATROSS, this being the widely distributed *Boccardia polybranchia* (Haswell).

Key to Genera.

a. Fifth (or fourth) setigerous somite not specially modified.
 b. With no branchiae.
  c. Body separated into two sharply distinct regions by difference in setae, the first nine somites bearing simple setae only, the others exclusively hooded crochets; ventral lamellae of more or less constant form, or changing but gradually .... *Magelona* F. Müller.
  cc. Body not thus divided into two sharply limited regions; ventral lamellae prominent only on the first four pairs of parapodia .... *Spiophanes* Grube.
 bb. Branchiae present.
  c. Prostomium without frontal processes or cornua.
   d. Branchiae present on the first setigerous somite.
    e. Branchiae on the first somite only .... *Streblospio* Webster.
    ee. Branchiae present also on some succeeding somites.
     f. Only four or five pairs of branchiae .... *Prionospio* Malmgren.
     ff. Numerous branchiae present.
      g. These present only on the anterior region of the body. *Laonice* Webster and Benedict.
      gg. Branchiae continuing to caudal end of body .... *Spio* Fabricius.
   dd. No branchiae on first setigerous somite.
    e. Branchiae beginning on the second somite.
     f. No crochets in notopodia.
      g. With anal cirri.
       h Hooded crochets beginning on the eighth or ninth somite........ *Microspio* Mesnil.
       hh. Hooded crochets beginning on fifteenth somite .... *Mesospio* Gravier.
      gg. Anal region cup-shaped, with no cirri .... *Nerinides* Mesnil.
     ff. Crochets present also in notopodia.
      g. With anal cirri .... *Aonides* Claparède.
      gg. Anal region cup-shaped, no cirri .... *Nerine* Johnston.
    ee. Branchiae beginning caudad of the second somite.
     f. Dorsal lamella free from the branchia .... *Spionides* Webster and Benedict.
     ff. Dorsal lamella fused with the branchia .... *Pygospio* Claparède.
  cc. Prostomium with frontal processes.
   d. Branchiae on first setigerous somite.
    e. Branchiae throughout length of body; no hooded crochets in notopodia.
     f. Body divided into two regions by a specialized somite, the sixteenth; dorsal cirri present on first four somites in addition to branchiae; a stout hooked seta on parapodia of first pair .... *Morants* Chamberlin.
     ff. Not so .... *Scolelepis* Blainville.
    ee. Branchiae absent from posterior region of body; hooded crochets also in notopodia. *Scolecolepides* Ehlers.
   dd. Branchiae beginning on second setigerous somite (hooded crochets in notopodia). *Marenzelleria* Mesnil.
aa. Either the fifth or the fourth setigerous somite specially modified.
 b. The fifth somite specially modified, bearing stout paleae.
  c. Branchiae beginning on the second setigerous somite .... *Boccardia* Carazzi.

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[1] *Cf.* Mesnil Bull. scient., 1897, **29**, p. 201, 209. Also Nussbaum, Zeitschr. wiss. zool., 1905, **79**, pl. 13–16; Giard, Compt. rend Assoc. Française, 1901, p. 153.

cc. Branchiae beginning caudad of the fifth setigerous somite.
  d. Hooded crochets beginning on the seventh setigerous somite...............*Polydora* Bosc.
  dd. Hooded crochets first appearing on the eighth setigerous somite........*Carrazia* Mesnil.
bb. The fourth setigerous somite specially modified.
  Reproducing by terminal buds as in many syllids......................*Polydorella* Augener.

Synonymy of Genera.

Nerinopsis Ehlers (1912), based upon certain pelagic and larval specimens (Chaetosphaera) secured by the GAUSS as well as by the British National Antarctic Expedition, is of doubtful position. Even the largest specimens wholly lacked the hooded crochets characteristic of the other spionids, and the form is placed by Ehlers in the Spionidae with some doubt.

Hekaterobranchus Buchanan (1890) seems to be the same as Streblospio Webster (1879) as at present defined.

Leucodore Johnston is synonymous with Polydora Bosc.

Malacoceros and Uncinia Quatrefages and Colobranchus Schmarda are synonyms of Scolelepis Blainville. Scolelepis Blainville has been subsequently written in the modified form *Scolecolipis* by Malmgren and others.

Chaetosphaera Häcker was proposed for certain widespread spionid larvae, the affinities of which are not yet known.

BOCCARDIA.

Carrazzi, Mitth. Zool. stat. Neapel, 1893, **11**, p. 15.

BOCCARDIA POLYBRANCHIA (Haswell).

Polydora polybranchia HASWELL, Proc. Linn. soc. N. S. W., 1885, **10**, p. 273; LO BIANCO, Atti R. acad. sci. fis. nat. Napoli, 1893, **5**, no. 11; EHLERS, Festsch. K. gesellsch. Göttingen, 1901, p. 164.
Boccardia polybranchia CARAZZI, Mitth. Zool. stat. Neapel, 1891, **11**, p. 15, pl. 2, fig. 1–3; MESNIL Compt. rendus Acad. sci., 1893, **117**, p. 643.
Polydora (Boccardia) polybranchia MESNIL, Bull. sci. France Belgique, 1896, **29**, p. 221; EHLERS, Polych. Magahl. sammel., 1897, p. 87; Nach. Geselsch. wiss. Göttingen, 1900, p. 217.

A single specimen of this species is in the collection, but labeled simply ALBATROSS. The species occurs commonly on the South American coast as well as in the Australian region.

DISOMIDIDAE.

Key to Genera.

a. Prostomium without tentacular processes; both neuropodial and notopodial cirri well developed on the first parapodia; notopodial setae of the most posterior somites stout spines forming star-shaped dorsal clusters..*Disomides,* nom. nov.

aa. Prostomium with a small anterior median process; notocirrus of first parapodia rudimentary; notopodial setae of the most posterior somites stout crochets arranged in transverse rows. *Paecilochaetus* Claparède.

Synonymy of Genera.

Disoma Oersted and Poecilochaetus Claparède, formerly included in the Spionidae, were removed as a distinct family by Mesnil (Bull. sci. France Belgique, 1897, **30**, p. 97), a procedure that seems amply justified. The two genera are clearly distinct and may be separated as indicated above. Since Disoma Oersted is preoccupied by Disoma Ehrenberg (Polyg., 1844), it is here replaced by Disomides and the family name is altered accordingly to Disomididae.

Other spionid genera, Magelona, Polydora, and Nerine of the Magelonidae, Polydoridae or Leucodoridae, and Nerinidae respectively have also been regarded as types of distinct families; but at present there seems no clear justification for these families.

CIRRATULIDAE.

The body of these annelids is elongated and linear, consisting of short somites which are numerous, sometimes exceeding three hundred and fifty. They are generally small or moderate in size, but may be as much as 300 millimeters long. They undergo strong retraction in preservation, often contracting to half their length. The color is nearly always uniform and some shade of brown or green, but may be a brighter shade of red; and occasionally the body is colored in spots over a paler background, as in *Cirratulus punctatus* Grube. The liquid or plasma of the blood is red, containing haemoglobin, this giving to the lateral branchiae a similar tinge and resulting in a characteristic appearance in these forms.

The prostomium is distinct, but much reduced in size, and is always devoid of appendages. Eyes present or absent; often present in young stages and absent in adults.

The mouth is ventral in position. The peristomium and two somites succeeding it are achaetous. On one or more of the anterior somites there may or may not be present dorsal tentacular cirri or large tentaculiform organs, recalling those of Spionidae, either dorsal or ventral in position.

Notopodial and neuropodial fascicles of setae are present, making the parapodia technically biramous; but there are no traces whatsoever of setigerous protuberances or of either dorsal or ventral cirri, the body in consequence resembling that of lumbrinereids or of some oligochaetes.

The setae are mostly simple, capillary, or aciculiform, rarely composite (Acrocirrus). Commonly capillary setae and crochets occur in the notopodia, while usually shorter capillary setae and crochets, or crochets alone, may occur in the neuropodia.

Mostly long and filiform branchiae, which are contractile, occur in a dorsolateral position on a variable number of somites.

The proboscis is always unarmed.

Epitokous forms are frequent in the genera of the subfamily Dodecaceriinae, established below, but are not known in those of the Cirratulinae proper. Some species develop both smaller, pelagic, epitokous forms and larger, sedentary, epitokous forms, as Caullery and Mesnil in their brilliant work on epitoky in this family have so thoroughly demonstrated for *Dodecaceria concharum* Oersted.[1] In the epitokous stage, as also observed so frequently in other families having similiar pelagic forms, the notopodia tend to develop very long and fine natatory setae. Modifications in the eyes and in the musculature have also been observed, *e.g.*, in *D. concharum.* In the epitokous stage in Dodecaceria the palpi tend to atrophy and the forms then may for the time conform nearly to the definition of Cirrineris Blainville. Mesnil and Caullery find *D. concharum* in its first or ordinary form to be parthenogenetic. It is in this stage also viviparous. Viviparity has also been detected in *Cirratulus chrysoderma* Claparède. Some species formerly described as belonging to Grube's genus Heterocirrus are shown to have been based on stages of Dodecaceria (*e.g.*, *Heterocirrus saxicola* Grube and *H. fimbriatus* Verrill, being epitokous phases of *Dodecaceria concharum* Oersted).

The cirratulids live mostly in or near the littoral region though occasionally descending to as much as 1,250 fathoms, as in the case of *Chaetozone benthaliana* McIntosh of the Challenger expedition. They live by preference in muddy sand and are frequently found in slime of a putrid odor. *Dodecaceria concharum* takes its specific name from the fact that it frequents burrows in calcareous rocks and particularly old and broken shells; it also occurs in the calcareous Algae, such as Melobesia and Lithothamnion,[2] and bores even in sandstone. This species is frequent in oyster shells. The alimentary tract of cirratulids has been found to contain mud in which are noted fragments of such forms as small Crustacea, spicules of sponges, foraminifers, radiolarians, and diatoms (McIntosh, Challenger Annelida, 1885, p. 383–385).

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[1] See Mesnil and Caullery, Sur l'existence des formes épitoques chez les annélides de la famille des Cirratuliens, Compt. rendus Acad. sci., 1896, and, more particularly, Les formes épitoques et l'évolution des cirratuliens, Ann. Univ. Lyon, 1898, p. 189.

[2] *Cf.* Gravier, Nouv. arch. Mus. hist. nat., 1908, **10**, p. 151, and McIntosh, British annelids, 1915, **3**, pt. 1, p. 256, 257.

The classification of the cirratulids is not in a wholly satisfactory condition either as to genera or as to species. A revision is much needed that shall be based upon a thorough study of type-species and their development along the lines so well initiated by Caullery and Mesnil. Until this is done the significance or reality of certain genera must remain problematical. In the following key the genera are taken up as more commonly conceived.

Key to Genera.

a. Without large prehensile tentacles . . . . *Cirratulinae*, subfam. nov.
  b. Only lateral branchial filaments present, these occurring usually on nearly all somites. *Cirrineris* Blainville.
  bb. Some dorsal filaments or cirri present in addition to the lateral ones.
    c. The dorsal cirri occurring on the first setigerous somite and often on one or more of the following ones as well . . . . *Cirratulus* Lamarck.
    cc. No dorsal cirri on the first one or more somites, but these present on one to several of the following ones . . . . *Audouinia* Quatrefages.
aa. With large prehensile tentacles (recalling those of the Spionidea) . . . . *Dodecaceriinae*, subfam. nov.
  b. Body with two divisions, an anterior of nine somites and a posterior, of which the first somite is twice as long as those of the anterior region and bears different and shorter setae and crochets. *Cirratulispio* McIntosh.
  bb. Not so.
    c. Branchiae few in number (one to eight pairs).
      d. Palpi borne on the prostomium; composite setae present.
        e. Branchiae present on the first metastomial somite.
          f. First metastomial somite bearing two pairs of branchial filaments . . . . *Acrocirrus* Grube.
          ff. First metastomial somite bearing only a single pair of branchiae. *Ledon* Webster and Benedict.
        ee. No branchiae present on the first metastomial somite . . . . *Macrochaeta* Grube.
      dd. Palpi borne on the first metastomial somite; setae all simple. Branchiae from four to eight pairs . . . . *Dodecaceria* Oersted.
    cc. Branchiae rather numerous.
      d. Acicular setae adorning nearly the entire circumference of the posterior somites. *Chaetozone* Malmgren.
      dd. Acicular setae not thus encircling the posterior somites.
        e. Acicular setae, either entire or bidentate, occurring in both notopodia and neuropodia. *Caulleriella*, gen. nov.[1]
        ee. Setae all fine, capillary . . . . *Tharyx* Webster and Benedict.

CIRRINERIS Blainville.

Dict. sci. nat., 1828, **57**, p. 488; ST. JOSEPH, Ann. sci. nat., 1894, ser. 5, **17**, p. 42; MESNIL and CAULLERY, Ann. Univ. Lyon, 1898, p. 110.
Cirrhineris QUATREFAGES, Hist. nat. annelés, 1865, **1**, p. 462.
Labranda KINBERG, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 255.

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[1] Genotype, *C. viridis* (Langerhans) (*Cirratulus viridis* Langerhans). Including also *Heterocirrus caput-esocis* St. Joseph, *Cirratulus fragilis* Leidy, and perhaps *Cirratulus bioculatus* Keferstein.

CIRRINERIS NESIOTES, sp. nov.

Plate **70**, fig. 5, 6.

The general color of the body in the type is at present dark grey, of a somewhat greenish or brownish green cast. The branchiae are yellow.

The body is relatively stout. It is widest at the anterior third or fourth, from where the body narrows continuously caudad, the caudal region being slender and subconically pointed. From the widest region the body narrows conically cephalad. The number of setigerous somites is nearly 190. The total length is near 55 mm.; the greatest width, 6.25 mm.

The prostomium is somewhat flattened, subtriangular in outline, but with the anterior end well rounded. Its surface is irregularly roughened with nodular elevations and depressions. There are some vaguely darkened areas and many very fine dark specks, but whether these represent eyes or not cannot be decided in the specimen as it is at present.

The peristomium widens continuously caudad from the prostomium, with which it forms a rather narrow cone. In length it is 2.2 mm., its width at base being a little greater, about 2.5 mm. Dorsally it is divided by transverse sulci into seven or eight short, in part incomplete, bands or partial annuli, the surface of which is broken up into numerous small areas by a reticulation of finer sulci. The ventral surface is smoother than the dorsal. It shows three principal but not clearly separated divisions. The border of the mouth is crossed by numerous, fine, radiating sulci, as usual.

The first setigerous somite is longer than the succeeding, the second a little shorter, the third and fourth further decreasing, while a considerable number of those immediately following are extremely short. Toward the widest part of the body the segments increase very materially in length but are always proportionately very short and closely crowded. In the widest part of the body the width of a somite is eighteen or more times the length. Dorsally the first and second somites are roughened by reticulating sulci like the dorsum of the peristomium, the succeeding segments quickly assuming a smooth condition. The setigerous segments are all distinctly separated from each other and are undivided.

The branchiae when fully extended have a maximum length of about 10 mm. In the preserved specimens they do not curl spirally, but remain extended or irregularly bent. They occur on all segments nearly to the caudal end, or excepting on the last seven to ten. They are of the same stoutness posteriorly as anteriorly, or nearly so. The ordinary branchiae are inserted a little above the notopodial tubercle on the anterior segment; the distance of the point of insertion increases caudad, and in the middle and caudal regions approaches, but does not fully equal, the distance between the neuropodial and notopodial tubercles. No special branchiae can be detected in the type. Neither tentacles nor scars of any can be found.

The setigerous tubercles on each somite are widely separated, the distance between them in all parts exceeding that between notopodium and point of insertion of branchia (in the middle region, about 1.8 mm. instead of 1.2 mm., and near the beginning of posterior third, 1.6 mm. instead of 1 mm.). Neither the setigerous tubercles nor the branchiae arise from any ridge. Where the branchiae have fallen off a longitudinal furrow is seen along the line of their insertions.

The ventral spines are detected first on from the thirty seventh to the thirty ninth setigerous somite, or near that region. On the more anterior somite they are three in number but quickly rise in the widest part of the body to four or rarely five, though somites with but three may occur between those having the larger number. Caudad the number again falls to three, and this is the number occurring throughout most of the body length. The most anterior ventral spines are shorter and straight, or nearly so, the size increasing caudad and the exposed region becoming conspicuously curved, with the concavity cephalad. They are dark colored and strongly cross-striate. (Plate **70**, fig. 5). The notopodial spines seem to occur first about twenty somites farther caudad than the first of the ventral ones. They are paler and more slender than the ventral ones, and in each notopodium there are five or four, or the number rises to six farther caudad on the somites that bear but three, much stouter, neuropodial spines.

LOCALITY. Galapagos Archipelago: Chatham Island. Shore. 18 January, 1904. One specimen.

This species is distinguished from others of the group primarily by the arrangement of the setae and spines, namely, in having in both series only capillary setae on the most anterior, and in the others both capillary setae and spines. *C. crassicolis* (Kinberg) from near Honolulu differs, *e.g.*, in the arrangement of spines, in the greater relative stoutness of the anterior branchiae, and the fewer segments.

CIRRATULUS Lamarck.

Anim. s. verteb., 1801, **5**, p. 300; JOHNSTON, Cat. annelids Brit. mus., 1865, p. 209.
Cirrhatulus AUDOUIN and MILNE EDWARDS, Hist. nat. litt. France. Annélides, 1834, **2**, p. 268; QUATREFAGES, Hist. nat. annelés, 1865, **1**, p. 454.

Cirrhatula TEMPLETON, Mag. nat. hist., 1836, **9**, p. 234.
Timarate KINBERG, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 254.
Promenia KINBERG, *Op. cit.*, 1865, no. 4, p. 254.
Archidice KINBERG, *Op. cit.*, 1865, no. 4, p. 255.

CIRRATULUS MEGALUS, sp. nov.

Plate **70**, fig. 1–4.

Special branchiae on first setigerous segment in a group of at least eight on each side, the two groups widely separated by a naked dorsal area. A single branchia on the second somite on each side.

The number of setigerous segments in the two specimens is nearly 186 and 205 respectively. Total length 260 mm.; greatest width about 13 mm.

The color of the preserved specimens is a somewhat brownish grey, of a greenish cast. A pale median longitudinal ventral line. Branchiae yellowish.

The body is stout, widest near the middle and strongly tapering towards both ends, with the caudal end somewhat the more pointed. The dorsal surface is strongly convex, hemicylindrical, while the ventral surface is flat. There is a conspicuous, fine, median longitudinal sulcus along the dorsum, the sulcus deepest on the line separating the somites.

The prostomium is short and wide. Anteriorly convex, semicircular; depressed a little above the anterior margin, with a weak median longitudinal sulcus. No eyes evident. (Plate **78**, fig. 1).

Peristomium long, equalling the succeeding seven somites. Partially and irregularly divided into three rings above and laterally. Of these rings the last two are divided by a transverse sulcus above, and the second has a median dorsal triangular impression at its caudal border. The anterior ring is crossed above and in front by a deep sulcus which at the middle is semicircularly curved forwards. Beginning near each side of the mouth is a weak furrow which runs caudad and mesad to meet the one from the opposite side at the midventral line on the caudal edge of the peristomium. The ventral area enclosed by these furrows is divided by a transverse sulcus into a nearly smooth triangular area and an anterior area between this and the mouth which is divided by transverse sulci into four narrow transverse bands. Along the dorsolateral surface, especially of the caudal ring, are some short longitudinal sulci. The caudal border of the mouth is divided into radiating ridges by numerous fine sulci. (Plate **70**, fig. 4).

The first somite is longer than those succeeding; above it is conspicuously, sublongitudinally wrinkled. The succeeding segments are smooth; they are undivided above but show ventrally a vague transverse line marking off a shorter caudal from a longer anterior part. The anus is small, circular, and terminal, opening somewhat more dorsad than ventrad, the ventral border projecting somewhat caudad. The setigerous segments are all distinctly separated; in the type they are about one thirteenth as long as wide and further caudad may be as much as one seventh.

The branchiae are numerous, and their precise proportionate length cannot be determined because of their tangled and broken condition, but would seem at most not to exceed four times the diameter of the body. The branchiae occur in pairs on all the segments of the anterior region and caudad in the large specimen, as judged by the scars, to about the seventeenth segment from the caudal end. In the anterior region each branchia is inserted at the edge of the dorsal continuation of the elevated ridge bearing the setae; the distance of the branchiae above the notopodial tuft increases caudad to the middle region of body, over which the distance remains essentially constant, this being in the type about 3.2 mm. The vertical ridges above the notopodia become less distinct and finally obliterated caudad. The special branchiae occur in a tuft on each side of the first setigerous somite. The exact number in each tuft could not be determined, but in the paratype it seems to be between twelve and eighteen. They do not extend far up the side, there being a wide naked region on the dorsum.

The setigerous tubercles are, as usual, well separated, though in the middle region the distance between them is much less than that between notopodium and the branchia (1.8 mm. as against 3.2 mm.). They are borne upon a ridge, the upper end of which is extended beyond and bears at its edge the branchia. The ventral spines, as nearly as could be determined, appear first on the fifty fifth somite in one specimen and the sixty fifth in the other. The dorsal spines could be found first on about the one hundred and twentieth somite in one, and the hundred and sixty fifth in the other, but the bad condition of the specimens renders some error likely. The most anterior ventral spines are pale, these caudad soon becoming darker and stouter. The number of ventral spines is two or three, three being the maximum. These spines in the posterior region are dark, stout, and straight, and show both cross and longitudinal striations. (Plate **70**, fig. 3). The anterior spines are paler and rather less stout. The dorsal spines are paler and more slender. The capillary setae are long, those of the notopodia being longer than the neuropodials. They are finely closely serrate on one side throughout their length. (Plate **70**, fig. 3, 4).

Locality. Off Peru: Sta. 4653 (lat. 5° 47′ S., long. 81° 24′ W.). Depth 536 fms. Bottom of dark brown volcanic mud. Bottom temp. 41.3° F. 12 November, 1904. Two specimens.

This species is exceptional in its large size and in the considerable depth at which it lives, the members of the genus being almost exclusively littoral. It has resemblances to *C. capensis* Schmarda, but has the special branchiae on the first instead of on the second somite, has the somites of a different proportion, the ventral spines without the curvature characterizing those of that species, etc. *Cirratulus capensis* is also a large species, the maximum length recorded being 200 mm., with a maximum width of 9 mm., which is considerably smaller than the type of the present species.

Cirratulus sinincolens, sp. nov.[1]

Plate **70**, fig. 7–10.

The general color of the types at present is grey, in parts of very slight brownish tinge.

The larger of the two type-specimens is incomplete caudally, sixty five somites being present. Its total length is about 60 mm. and the maximum width 11.5 mm. The smaller specimen is complete. It has a total length of about 95 mm., a maximum width of 7.5 mm., and consists of 107 or 108 somites. The general form of the body is essentially as usual in the genus, broadest and highest in front of the middle, and tapering at both ends. The dorsal surface strongly convex, the ventral flat.

The prostomium is short and broad. In outline as seen from above with the anterior margin semicircularly rounded, on the lateral portions more flattened, and giving the appearance, roughly, of a trapezium or truncate triangle with the sides toward the base flaring ectad. The prostomium is much highest across the caudal end, being strongly transversely depressed in front and the slope of the caudal portion very steep, not marked with any distinct longitudinal furrow. On each side separated from proboscis by a deep, vertical sulcus which extends from the border of the mouth toward the dorsum, upon which it does not extend, setting off a caudal band. This band is essentially fused with the peristomium above. The sulcus is weak in the smaller specimen.

The peristomium is abruptly more slender than the succeeding portion of the body, cylindrical in form, and long, its length equalling that of the succeeding seven somites taken together. On each side deep sulci separate off six (or five in the smaller specimen) vertical bands, but the sulci are not continuous with other, finer, sulci across the dorsum or with others across ventral surface, which are scarcely evident in the smaller specimen, a division into rings being thus incomplete and irregular. There is a longitudinal depression along the lower portions of each side. In the larger specimen, a longer, broad, trapeziform band in place of the triangular area in *megalus* is set off by a deeper furrow, the oblique lateral furrow extending up on the side. In front of these are four narrower transverse bands, the dividing sulci between which become vaguer cephalad. The anterior ventral margin is widely concave.

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[1] sinus, gulf, incolere, to inhabit.

The first metastomial somite is larger than the succeeding ones, though not fully as long as the next two taken together. Dorsally it is marked with irregular sulci or wrinkles, giving a coriarious appearance. The succeeding somites increase gradually in width and height to the wide region of the body, but increase only slightly in length. They are all wholly simple, transverse sulci occurring neither above nor below. The surface of all, as preserved, is coriarious. The anus is terminal and transverse, somewhat crescentic, the ventral border projecting convexly dorsad. The border is divided into six lobes, a large median ventral one, one at each end, and three in the arch above.

The setigerous tubercles are widely separated, in all cases clearly exceeding the distance between notopodium and branchia. They are distinct and conical. In the broad region in front of the middle in the larger specimen the tubercles are about 1.5 mm. long. They are at the opposite ends of distinct vertical ridges, which are not extended dorsad beyond the notopodium to the branchia as they are in the case of *megalus*.

The poorly preserved and much rubbed condition of the types does not permit a wholly satisfactory study of the setae. Mounted parapodia from several regions of the body show in all cases two types of capillary setae. In each notopodium on the ventral side, and in each neuropodium on the dorsal side of the fascia, a number of exceedingly fine capillary setae which run out into very fine tips (Plate **70**, fig. 10), and, below these, more numerous, much coarser and longer setae, which are also attenuated distad into very fine, smooth, and commonly curved tips. Below the tips along one side these setae have a close series of scales or fine serrations. These setae are finely longitudinally fibrillated. (Plate **70**, fig. 9). In the neuropodia of the posterior region, at least, there is, ventrad, of the principal setae and standing somewhat apart from them, an obviously stouter single seta or spine which probably represents a crochet. It is strongly longitudinally fibrillated, acutely pointed distad and, so far as made out, wholly lacked any marginal serration. (Plate **70**, fig. 8). The distribution forward of this spine could not be followed with certainty.

Branchiae in general occur, a pair on each somite, back at least as far as the eightieth somite. Each of the paired branchiae is inserted above the notopodium toward the caudal border of the somite, the distance above the notopodium not being large. The branchiae are filiform, distally pointed, and long, though most are broken off and could not be measured. In the smaller specimen, a possibly complete branchia on about the twentieth somite is but 6 mm. long, while one near the eightieth somite measured 20 mm. The special branchiae are on the first somite. On the left side in both specimens there is a single branchia just above the notopodium; above this is a slightly raised mound from which one long and one short branchia arise, in the smaller specimen the one appearing as a branch from the base of the other. In this specimen, too, the single, or ventral, branchia is very small, probably in process of regeneration. On the right side in both specimens are three branchiae arising close together in a single group from a common elevation, of which one is long and two short. There is a very wide, naked, dorsal area between the two groups of branchiae.

LOCALITY. Gulf of California: Sta. 3435 (lat. 26° 48′ N., long. 110° 45′ 20″ W.). Depth 859 fms. Bottom of brown mud with black specks. Bottom temp. 37.3° F. 22 April, 1891. Two specimens.

This species would seem to be well characterized through the almost complete obliteration of crochets as such, the high number of partial divisions in the peristomium, and the fewness of the special branchiae, with their situation on the first setigerous somite. It is much smaller than the preceding species and larger than *C. robustus* Johnson occurring farther north in the littoral region.

CIRRATULUS DANIELSENI Hansen.

Mem. cour. savants étrang., 1881, **44**, p. 17, pl. 5, fig. 11–15.

This species, described originally from the Bay of Rio de Janeiro, conforms to Timarete as defined by Kinberg.

LOCALITY.— Brazil: Abrolhos, off the Coast. 28 December, 1887. One well-preserved specimen.

AUDOUINIA Quatrefages.

Hist. nat. annelés, 1865, **1**, p. 459.

AUDOUINIA FILIGERA NESOPHILA, subsp. nov.[1]

Plate **70**, fig. 5, 6.

The general color of the body is a somewhat slaty black. The branchiae are bright yellow.

The body is moderately slender. It is conically pointed at both ends, but the caudal end is somewhat more slenderly so. The middle two thirds or three fourths of the length is nearly uniform in thickness. The total number of setigerous somites is in the neighborhood of 390. The total length is 75 mm.; the greatest width about 3.5 mm.

The prostomium is subconical, flattened, with the anterior end bluntly rounded. It is abruptly narrower than the peristomium. No eyes detected.

The peristomium is longer than the prostomium in about ratio of three to two. It is in outline roughly trapeziform, with the lateral borders convex. The dorsal surface is divided by transverse and cross sulci into a number of irregular rounded tubercles or areas. It appears as usual to be formed by the fusion of three primary somites. The length of prostomium and peristomium together is *cir.* 1.1 mm.; the width at base *cir.* 1.8 mm. The border of the mouth is radially wrinkled, as usual.

The first setigerous somite, as usual, is longer than the second, those following reducing gradually and being very short. From the end of the anterior fourth or fifth the segments increase somewhat in length, but remain of nearly uniform length over the middle and posterior regions. At the middle of the body the somites are sixteen or seventeen times wider than long. The somites in general are thus very short and closely crowded. All are distinctly separated from each other. Ventrally they show an indistinct division by transverse suture into two very unequal parts, the caudal of these being the shorter.

The branchiae in general are fine and cirriform, those of the anterior region being but little coarser than those of the posterior. The longest noted had a length of 15 mm., being thus four or five times the width of the body in the middle region. The branchiae in the anterior region arise in contact with the dorsal setigerous tubercle and farther back the point of insertion is but little removed from it. The paired branchiae occur anteriorly on all setigerous somites except apparently the first. The special branchiae occur on the seventh setigerous

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[1] νῆσος, island, and φίλος, loving.

segment; they form a band across the dorsum, with the filaments more closely crowded laterally.

The upper and lower fasciae of setae are separated by a moderate space, the distance between them in the type being only .6 or .7 mm.

The tubercles are weak and do not arise from any distinct ridge such as occurs in many species (*e.g.*, *C. megalus*).

Spines occur in most of the ventral fasciae. They are proportionately stout and their apices project freely but a short distance. In each fascicle there are three, or less commonly, four spines. They occur well forward, but the segment on which they first appear could not be determined with certainty. (Plate **70**, fig. 5). The spines of the notopodia are paler and more slender, and are more numerous in each fascia. The capillary setae relatively long. (Plate **70**, fig. 6).

LOCALITY. Easter Island: 20 December, 1904. Shore. One specimen.

Audouinia filigera Delle Chiaji is used here as by Ehlers (Abh. K. gesellsch. wiss. Göttingen. Math. phys. klasse, 1901, p. 183), to include also *A. lamarckii* Audouin and Milne Edwards (1840). Other synonymous names are *australia* Gay (1859) and *chiajei* Marenzeller (1888). The unsatisfactory condition of the classification of this and related genera makes it difficult to determine species, in the absence of extensive material, from the literature. The large number of somites proportionately to length in the present form is noteworthy. It seems to differ from the species also in coloration and in proportions. *A. filigera* is common along the Chilean and Patagonian Coasts, as well as in the Atlantic. Ehlers did not find any Chilean or Patagonian specimen having the dorsal branchiae inserted on the seventh somite as in the present form, though such occur in the Atlantic (*lamarckii*). St. Joseph (Ann. sci. nat., 1894, ser. 5, **17**, p. 51) notes variations in this respect. Marenzeller (Zool. jahrb. Syst., 1888, **3**, pt. 1, p. 16) records a form of this species, variety *meridionalis*, from Angra Pequena Bay.

DODECACERIA Oersted.

Annulatorum Danicorum conspectus, 1843, p. 44; MESNIL and CAULLERY, Ann. Univ. Lyon, 1898, p. 116; McINTOSH, British annelids, 1915, **3**, pt. 1, p. 254.
Heterocirrus GRUBE, Archiv. naturg., 1855, **21**, p. 108.
Dodecaceria + *Heterocirrus* QUATREFAGES, Hist. nat. annelés, 1865, **1**, p. 465 (in part).
Naraganseta LEIDY, Journ. Acad. nat. sci. Philad., 1855, ser. 2, **3**, p. 144.

DODECACERIA CONCHARUM Oersted.

Annulatorum Danicorum conspectus, 1843, p. 44, fig. 99; MESNIL and CAULLERY, Ann. Univ. Lyon, 1898, p. 5, pl. 1, 2; McINTOSH, British annelids, 1915, **3**, pt. 1, p. 255.
?*Nereis sextentaculata* DELLE CHIAJI, Mem. anim. regn. Napoli, 1828, **3**, p. 176, pl. 43, f. 16.
Cirratulus concharum GRUBE, Fam. annel., 1851, p. 68.

Terebella astreae Dalyell, Pow. creat., 1853, **2**, p. 209, pl. 26, fig. 10.
Naraganseta corallii Leidy, Journ. Acad. nat. sci. Philad., 1855, ser. 2, **3**, p. 144, pl. 2, fig. 46–48.
Heterocirrus saxicola Grube, Archiv. naturg., 1855, p. 109, pl. 4, f. 11.
Heterocirrus saxicola Marion and Bobretzky, Ann. sci. nat., 1875, ser. 6, **2**, p. 67.
Heterocirrus fimbriatus Verrill, Check-list marine invert. Atlantic coast, 1879, p. 11.

Locality. Off Newfoundland: Sta. 2446 (lat. 46° 20′ N., long. 49° 52′ W.). Depth 40 fms. Bottom of broken shells. Bottom temp. 35.5° F. The anterior half of one specimen.

OPHELIIDAE.

These are forms always of small or moderate size, the largest rarely exceeding six centimeters, with the number of somites mostly between twenty-five and forty. The color in life is most commonly a rose or pinkish red, due to great vascularity, to which is commonly added a purplish or other hue due to iridescence at the surface of the cuticle, which is smooth and glistening.

The prostomium not strongly differentiated; either rounded in front or conically pointed, often with a median prolongation or tentacle. Ciliated nuchal organs are exsertile from pits located posteriorly. Eyes may or may not be present.

Peristomium without tentacular cirri, but normally setigerous and often with setigerous papillae.

The somites in general are subdivided into a number of distinct annuli; rarely the somites are not superficially divided off from each other. In some genera eyes occur along the sides of the body, also peculiar segmental sensory pits.

The parapodia are not conspicuously developed. They are structurally biramous, though the notopodial and neuropodial setae sometimes are merged into a fascia essentially single. Setigerous papillae either present or absent. Notocirri sometimes absent, but more commonly present as branchial organs, and either occurring over essentially the entire length, or else restricted to one region, — anterior, posterior, or median. Neurocirri may also be present, but are more frequently absent or aborted.

The setae are all capillary and simple. They may be wholly smooth, limbate, or serrulate. Often they are rudimentary over part or all of the body, and rarely not superficially evident.

The nephridia occur in a considerable number of somites of the posterior region as paired tubules with open, ciliated, internal funnels and opening externally by nephridiopores, as usual.

The blood is reddish from the presence of haemoglobin. It contains a number of rounded and in part, at least, amoeboid corpuscles, which are colored with haemoglobin from the surrounding medium. The fluid gives its color to the branchiae and commonly to the body in general.

There is a short, evaginable proboscis, often forming a simple button, with rosette-like folds. Intestine commonly filled with sand or other material from the medium in which they live.

The opheliids live in large part in pure sand, but often occur in sand mixed with mud, or in mud or slime sometimes of a strongly odoriferous character. They burrow in the sand and mud like lancelets. While they are essentially shallow water forms, some occasionally are found at considerable depths; and *Kesun fusus*, the interesting form described below (p. 386) was secured at the great depth of 2,463 fathoms and *Travisia profundi* at 2,222 fathoms, depths much exceeding any other recorded for the family.

The resemblance to Amphioxus in habits of many species is accompanied by a corresponding superficial resemblance in form, as well as in size, translucency, consistency, movements, and distribution, as pointed out by Willey (Ceylon pearl oyster fisheries report, 1905, pt. 4, p. 288) in his note on *Armandia lanceolata:* "Although infinitely removed from each other in morphology, Armandia and Amphioxus are closely approximated in bionomics. It is a case of true homoplasy; there is no question of affinity, nor of mimicry, nor of parallel evolution." These resemblances were previously pointed out by Lo Bianco (Atti R. acad. sci. fis. nat. Napoli, 1893, ser. 2, **5**, no. 11) for another species of the same genus, *Armandia polyopthalma.* Some forms are very sluggish, such as *Ophelia limacina* and, in general, other species of this genus and also the species of Travisia. In captivity these forms exhibit merely slight elongations and contractions, or roll about rather inertly, sometimes thrusting the snout here and there. The strong muscular development, however, indicates considerable power in burrowing. On the other hand, as pointed out by Phillippson (Zool. anz., 1899, **22**, p. 417), Polyopthalmus is specialized for locomotion, and the contrast it affords with the preceding highly sedentary type, he thinks, clearly exhibits the artificiality of the much used division of the polychaetes into the Sedentaria and Errantia. Also very active is Ammotrypane, McIntosh (British annelids, 1915, **3**, pt. 1, p. 17, 21) remarking in regard to *A. aulogaster:* "The extraordinary activity and vigor of the living animals at once attract attention. They exceed most annelids in the display of violent muscular action, as they rush about in every direction through water or sand, mucus or mud, and then generally plunge into sand." And of *Armandiella robertianae:* "Like its congeners this species is an active inhabitant of muddy sand, and it swims through the sand swiftly, like an eel."

They live upon organisms occurring in the medium they frequent. In the sand or mud in their intestines are found sponge-spicules, diatoms, radiolarians, Foraminifera, and the remains of various other organisms.

Key to Genera.

a. Lateral eyes present along the body and often on the prostomium; branchiae none, or but rarely present (Armandiella) .... *Polyopthalminae.*

b. No cirri or branchiae present; somites distinctly separated.

c. Prostomium bearing a median process or tentacle in front; eyes with crystallines. *Armandia* Filippi.

cc. Prostomium without median process in front, rounded; eyes without crystallines. *Polyopthalmus* Quatrefages.

bb. Lateral cirri or branchiae present; somites not distinctly separated ...... *Armandiella* McIntosh.

aa. No eyes either on body or on prostomium, or rarely present, when present, branchiae also present; branchiae present, or rarely absent.

b. No branchiae (or cirri) present .... *Opheliinae.*

c. Lateral segmental sensory pits present; the fascicles of setae sessile; body short and stout, grub-shaped .... *Kesun,* gen. nov.

cc. No lateral segmental sensory pits; with distinct setigerous mamilae; body proportionately long and slender .... *Tachytrypane* McIntosh.

bb. Branchiae present.

c. Branchiae pectinately branched; setae in preserved specimens not obvious (absent ?); anal cirrus single, proximally flattened .... *Euzonus* Grube.

cc. Branchiae not pectinately branched, unifilamentous or rarely bifilamentous.

d. Some or all of the setae serrulate. (Body with a longitudinal ventral furrow).

e. All setae finely serrulate .... *Cassandane* Kinberg.

ee. Part of the setae smooth, part serrulate-spinous .... *Nitetis* Kinberg.

dd. Setae smooth or simply limbate. (With or without a ventral furrow).

e. Body with a ventral furrow over all or part of length.

f. Body rounded anteriorly, grooved ventrally posteriorly; parapodia well-developed, fascicles distinct, with mamilla between them.

g. Branchiae simple, filiform; no anal plate; body not abruptly separated into a thoracic and abdominal region .... *Ophelia* Savigny.

gg. Branchiae all bifilamentous; an anal plate present; thorax sharply set off from abdomen .... *Thoracophelia* Ehlers.

ff. Body grooved ventrally over entire length; parapodia often weakly developed and with the fascicles essentially single, or with the separation between notopodials and neuropodials weak and not accompanied by intervening mamilla.

g. At the caudal end the body prolonged into a long, cylindrical or even somewhat clavate, tube at the tip of which is the anus, this tube usually finely furrowed transversely.

h. Branchiae normally and uniformly developed over the entire or nearly the entire length; a distinct single median anal cirrus .... *Omaria* Grube.

hh. Branchiae not uniformly developed.

i. Branchiae very few, present only on the posterior median region; last pairs of setigerous processes not specially prominent .... *Ammotrypanella* McIntosh.

ii. Branchiae more numerous, absent from the median region but unusually strongly developed toward the ends; last (four) pairs of setigerous processes conspicuously salient .... *Urosiphon,* gen. nov.[1]

gg. Body not with a long cylindrical anal tube, the anal tube or scoop short.

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[1] GENOTYPE, *Ammotrypane cylindrocaudatus* Hansen. *οὐρά,* tail, and *σίφων,* a tube.

h. Prostomium with a pronounced knob or boss on each side, the snout long and tapering, its terminal process distally enlarged like a probe. *Antiobactrum*, gen. nov.[1]

hh. Prostomium with no such lateral bosses, simply conical, not thus prolonged, but sometimes bearing a stalked mucro.

  i. Pharynx with a fascia of elongate papillae on each side of the mouth.

    j. Setae smooth (branchiae lacking on first two and last two pairs of parapodia in type)..*Ladice* Kinberg.

    jj. Setae limbate (branchiae on all parapodia-bearing somites). *Terpsichore* Kinberg.

  ii. Pharynx not with such lateral fasciae of elongate papillae. .*Ammotrypane* Rathke.

ee. Body without a midventral longitudinal furrow or a ventral sole.

f. First setae borne on first complete ring caudad of mouth; setae partly smooth and partly serrulate-ciliate................................*Dindymenides*, nom. nov.

ff. First setae borne in front of mouth; setae all smooth..............*Travisia* Johnston.

Synonymy of Genera.

A considerable number of the genera in this family are very imperfectly known. Revisional work based upon plentiful material is much needed. In the tabulation I have taken up the known genera on such bases as the published accounts afford, though conscious of the slenderness of the basis of separation in several cases. It seems better to maintain genera established, rather than prematurely to merge them, until such time as our knowledge concerning them shall permit fuller judgment and furnish evidence for better classification. The division into Polyopthalminae and Opheliinae is retained without expressing a personal opinion as to its naturalness.

The type of Ophelina Oersted (1843), *O. acuminata* Oersted, is identical with the type of Ammotrypane H. Rathke (1843), *A. aulogaster* H. Rathke. Hence the name cannot be used for a different generic group as is done by Hansen and also by McIntosh for the genus Antiobactrum.

Dindymene Kinberg, being preoccupied in the Crustacea (1847), is replaced by Dindymenides.

KESUN, gen. nov.[2]

Body short, pointed at both ends, fusiform or grub-like. Body rounded cylindrically, without ventral groove. Somites of the middle region triannulate, while the others may be only biannulate or entire.

Prostomium small, wholly smooth and rounded, without processes.

Parapodial tubercles small and smooth, or wholly absent. No cirri or branchiae on any somites. No eyes. With a series of lateral sensory pits as in Travisia.

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[1] GENOTYPE, *Ophelina brasiliensis* Hansen. ἀνταῖος in front, and βάκτρον, a staff or rod.

[2] Gosiute, ke, no, none, and sung, sun, lung or gill (pasun).

Pygidium small, cylindrical, longitudinally furrowed.

Segments not numerous (twenty-eight in the type).

Genotype.— *Kesun fusus*, sp. nov.

Separated from Travisia by the complete absence of cirri.

Kesun fusus, sp. nov.

Plate 67, fig. 5; Plate 68, fig. 1, 2.

Body pointed at both ends, with the intervening region cylindrical, or slightly thicker anteriorly than posteriorly. The type is 14 mm. long with a maximum thickness of 2.5 mm. There are twenty-eight setigerous somites.

The prostomium is a small, wholly smooth process which is narrowed cephalad subconically, but is distally blunt. It is slightly compressed dorsoventrally. (Plate 68, fig. 1).

The peristomium strongly widening from the prostomium caudad. It is composed of three incomplete annuli. The surface is granular or finely vesicular, the vesicles being small and with those along the caudal edge largest. On each side there is the usual nuchal groove, this being deepest at its caudal end. (Plate 68, fig. 1).

The second somite is biannulate. Each annulus bears a single row of fine but distinct vesicular papillae, with in front of this smaller and more or less obscure ones. (Plate 68, fig. 1). The succeeding somites to and including the fifteenth are triannulate. The sixteenth, seventeenth, and eighteenth somites are biannulate, the two latter incompletely so laterally. The remaining somites are uniannulate, or with two or three of the most anterior of them with vague indications of subdivision. All annuli with a single row of well-formed but very small papillae, the granules in front of this row smaller and inconspicuous. All the annuli of somites of the anterior and middle regions are very short. The undivided posterior somites are considerably longer than the annuli of the anterior somites, but are shorter than the entire somites. (Plate 68, fig. 2).

Neither notopodial or neuropodial cirri or branchiae at all indicated on any of the segments.

Fascicles of setae small, in two rows. On the anterior somites the fascicles arise from the apices of distinct processes, or papillae, of about the same size or but little higher than the neighboring ordinary papillae occurring elsewhere on the somites. These setigerous papillae decrease in size caudad, finally becoming wholly obliterated, and leaving the setae sessile, arising directly from slits in the body-surface. There are lateral sensory pits between the neuropodia and notopodia on most somites, as in Travisia. (Plate **67**, fig. 5).

The pygidium is very small, short, and cylindrical, longitudinally weakly furrowed or canaliculate, and thus divided into twelve or fourteen inconspicuous lobes. Paler than the rest of the body. (Plate **68**, fig. 2).

LOCALITY. Toward the Marquesas: Sta. 3684 (lat. 0° 60′ N., long. 137° 54′ W.). Depth 2,463 fms. Bottom of greyish-yellow Globigerina ooze. 10 September, 1899. One specimen.

TRAVISIA Johnston.

Ann. nat. hist., 1840, **4**, p. 373; GRUBE, Fam. annel., 1851, p. 71; Sitz. Schlesch. gesellsch., 1868, p. 6; McINTOSH, British annelids, 1915, **3**, pt. 1, p. 25.

TRAVISIA PROFUNDI, sp. nov.

Plate **67**, fig. 1–4.

The color of the preserved animal is grey throughout.

The body is pointed at both ends, subfusiform, though conspicuously broadest in front of the middle, being broadest and decidedly deepest at about one third the distance from the anterior end. The dorsal surface strongly convex, the ventral more weakly so, but not truly flattened and not at all furrowed. The type is 27 mm. long and, at the thickest region, 5.25 mm. wide and 6 mm. deep. (Plate **67**, fig. 1).

The prostomium is a very small and bluntly rounded organ which is wholly smooth. (Plate **67**, fig. 1, 2).

The second somite widens strongly caudad like the frustum of a cone. It is distinctly biannular and is crossed longitudinally on each side at the dorsolateral level by the nuchal groove, which terminates anteriorly at the prostomium. The annuli are covered densely with contiguous, nodular, pustule-like papillae, of which there are five or six transverse rows on the first and four or five on the second. The first of these two annuli on the ventral side is deeply notched caudally, bordering the mouth in front and anteriorly at the sides, while the mouth completely divides the second annulus ventrally, its ends thus forming the remaining part of the lateral borders of the mouth. (Plate **67**, fig. 2).

The succeeding somite, *i.e.*, the second, is also biannular. Each annulus with a single transverse row of low, rounded papillae along the caudal border, with cephalad of this smaller papillae like those of the preceding somite, with the integument between the annuli proper appearing somewhat tesselated. The second annulus of the second somite is incomplete laterally and the first is deeply grooved ventrally where it borders the mouth on its caudal side. On each side of this somite between the two fascicles of setae is a sensory pit, the mouth of which is vertically lenticular in form. The third somite is triannulate, with the third annulus indistinct laterally. Papillae and integument as in the preceding somite. The following somites to and including the fourteenth are similarly triannulate in form, with papillae and integument the same. The fifteenth segment is incompletely triannulate, the two more caudal annuli being indistinguishable from each other laterally. The sixteenth and seventeenth somites are biannular, and the remaining somites are entire, or uniannular, with the annuli distinctly and abruptly larger than those of the preceding somites and with correspondingly more numerous, large, vesicular papillae, the papillae decreasing in size from the caudal edge cephalad to the interannular tesselated integument. The papillae are absent along the sides from a level a little above the upper setae to one a little below the lower ones, giving the effect of a longitudinal furrow along each side of the body, with the papillae above and below the groove large. (Plate 67, fig. 1).

The branchiae first appear on the third somite and occur on each one thereafter to and including the fourteenth, but are quite absent from all others. Each branchia is subfiliform, proximally subcylindrical, gradually narrowing distad, conically acuminate at tip; strongly transversely wrinkled. (Plate 67, fig. 1, 3). Those of the sixth to twelfth (Plate 67, fig. 4) somites longest, those of the fourteenth very short, with the thirteenth intermediate and the most anterior ones also very small. The longest ones in the preserved specimens do not exceed the length of the somite. Each branchia is inserted above the lateral sensory pit close to the notopodial setae on the third, or on the fused second and third, annulus of the somite.

The setae occur on somites from the second inclusive caudad. They arise from pits with slit-like openings into which they are apparently more or less retractile. (Plate 67, fig. 3, 4). They are pale, very fine, capillary forms of varying length, those of the notopodial tufts longer than the ventrals, as usual.

Pygidium short, conicocylindrical, truncate distad, divided by longitudinal sulci into ten or eleven lobes in the usual manner. (Plate 67, fig. 1).

LOCALITY. Off Peru: 111 miles N. W. of Aguja Point. Sta. 4651 (lat. 5° 42′ S., long. 83° W.). Depth 2,222 fms. 11 November, 1904. One specimen.

Travisia olens Ehlers, occurring in the Strait of Magellan, is a larger, more evenly fusiform species having thirty-one setigerous somites instead of only twenty-six in the present species. It has branchiae over practically the entire length, whereas in *profundi* these do not occur caudad of the fourteenth somite. Similarly *T. pupa* Moore, which is close to *olens*, is a much larger species, consisting of thirty-one or thirty-two somites, in which the branchiae likewise occur on all somites from the third to near the caudal end of the body. The annulation of the somites in this form is conspicuously different.

SCALIBREGMIDAE.

In this family the body is comparatively short, sometimes enlarged anteriorly, maggot-like in form, or fusiform. A very thin cuticle invests the thick granular hypoderm in such a way that the skin appears roughened or tesselated, especially anteriorly, in a characteristic manner. The color is often dull brick-red.

The prostomium is small, either with or without anterolateral, tentacle-like, prolongations; when the tentacles are absent the prostomium simply divided by a furrow into two rounded lobes. Eyes none, or so-called ocular bands present (Sclerocheilus). On each side a groove through which the nuchal organ may be everted.

The somites are distinctly annulated. In most species between the rami of each parapodium there is a small sense-organ which is retractile.

The parapodia are biramous, with notopodia and neuropodia equally developed, in some with protruding setigerous papillae not evident, the setigerous fasciae sessile, in others with the processes prominent.

The setae in general of two types, simple capillary setae and furcate setae with somewhat unequal, commonly barbed, branches. In addition, there may be present in the most anterior one to three setigerous somites setae of a much stouter, acicular type.

Branchiae either present or absent, when present confined to the first five or six somites and commonly beginning on the second.

Anal cirri either present or absent.

A pair of nephridia in each of the somites excepting a few of the most anterior. Each is a narrow ciliated tubule with internal funnel small and open.

Dioecious, with the gonads microscopic in size.

Pharynx eversible and wholly smooth.

Sometimes occurring between tide-marks and in shallow water, but perhaps most commonly to be secured by dredging, being found down to depths of 700 and 800 fms. They burrow in the sand and mud, in which they may penetrate to a depth of one or two feet. The habits in general, at least in the case of the best known form, *Scalibregma inflatum*, are much like those of the lugworm, or Arenicola. They are limivorous. In the intestine (*e.g.*, of *Polyphysia jeffreysi*) is found sand and mud, in which occur fragments of Foraminifera, Radiolaria, diatoms, sponge-spicules, crustaceans, and other organisms. Known from the temperate seas of both hemispheres and from the cold waters off northern Europe.

In general the members of the family are poorly known as to their detailed anatomy, variations, and development.

Key to Genera.

a. Prostomium with anterolateral tentacular processes.

  b. Parapodia of somites behind the twelfth or fifteenth projecting prominently at right angles to the body, each forming a laminate appendage bearing a dorsal and a ventral cirrus.

    c. Branchiae present on the anterior somites........................ *Scalibregma* H. Rathke.

    cc. No branchiae present.................................. *Pseudoscalibregma* Ashworth.

  bb. Parapodia not forming laminate appendages; no dorsal cirri; ventral cirri either absent or else present in the posterior region alone and digitiform.

    c. Stout acicular setae present on the first setigerous somite and sometimes also on the two following.

      d. With pigmented ocular bands; ventral cirri present in the posterior region; acicular setae present on the first setigerous somite only...................... *Sclerocheilus* Grube.

      dd. With no ocular bands; no ventral cirri; acicular setae on the first three setigerous somites.

        e. First three pairs of parapodia greatly exceeding the others in size, elliptic in outline, and much more widely separated; with a conspicuous anal tube abruptly much narrower than the body, with marginal papillae, but no anal cirri; acicular setae stout, conspicuous.. *Gwasitoa*, gen. nov.[1]

        ee. First three pairs of parapodia not thus strongly differing; with 5 slender anal cirri, no such conspicuous anal tube; acicular setae reduced, more slender. *Asclerocheilus* Ashworth.

    cc. No stout acicular setae on any of the somites; no cirri; an abruptly narrower, cylindrical anal tube.. *Kebuita*, gen. nov.[2]

aa. Prostomium with no anterolateral tentacular processes; divided by a median groove with each half simply rounded.

  b. Four (or six) pairs of branchiae present on somites II–V.............. *Polyphysia* Quatrefages.

  bb. No branchiae present........................... *Lipobranchius* Cunningham and Ramage.

This key represents the classification developed by Ashworth (Quart. journ. micr. sci., 1902, **45**, p. 237–309, pl. 13–15) in his excellent study of Scalibregma and its affinities.

Synonymy of Genera.

Eumenia Oersted (1843) is preoccupied in the Lepidoptera (God., 1825) as well as by a phyllodocid genus of Risso. Hence I adopt here Polyphysia

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[1] GENOTYPE, *Oncoscolex heterochaetus* Augener. Gosiute, gwasi, tail, and toa, tube.

[2] GENOTYPE, *Eumenia glabra* Ehlers. Gosiute, ke, no, and bui, eye.

Quatrefages, proposed as a substitute in 1865, but not used by subsequent workers.

Ashworth in discussing (*Op. cit.*, p. 292) the *Eumenia glabra* Ehlers, here established as the type of a new genus Kebuita, concludes that it stands apart in having the skin smooth and in that it "bears no signs of secondary annulation." However, upon reexamination of Ehlers's type I find that the skin in the anterior region and dorsally is strongly tesselated in the manner prevalent in the family and that the somites are distinctly annulated, as usual. Ashworth judges, as he says, from Ehlers's figure, which is inaccurate in respect to these features.

The *Oncoscolex* (*Eumenia*) *heterochaetus* of Augener (Bull. M. C. Z., 1906, **43**, p. 159, pl. 6, fig. 110–112), dredged by the BLAKE near St. Vincent, W. I., is not properly referred to Oncoscolex, a dubious genus apparently pertaining rather to the Capitellidae. Augener thinks his species possibly identical with Ehlers's *glabra* because of a general superficial resemblance; but the two forms are widely different, the conspicuous stout acicular blades of the first three somites and the conspicuously enlarged anterior parapodia of *heterochaeta* obviously separating it from the other species. In having the stouter setae on the first three setigerous somites *heterochaeta* is like the species named by St. Joseph (Ann. sci. nat., 1894, ser. 5, **17**, p. 113, pl. 5, fig. 146, 147) *Lipobranchius intermedius* and by Ashworth made the type of Asclerocheilus. I have not seen a specimen of *intermedius*; but relying upon St. Joseph's description and his statement that aside from the absence of eyes and ventral cirri, and certain differences in the segmental organs, ova, etc., "sous tous les autres rapports, l. *L. intermedius* est absolument semblable au *S. minutus* [*Schlerocheilus*]," I believe that species is not congeneric with *heterochaeta*, the type of which I have reexmined and for the latter proposed the new genus Gwasitoa.

Nevaya McIntosh (Ann. mag. nat. hist., 1911, ser. 8, **7**, p. 149, pl. 5, f.1–1h) is a somewhat enigmatic form placed in relationship to Schleirocheilus by its author. But it has no frontal processes, and in the key would be included in Lipobranchus, as it apparently has no branchiae. It possesses a strongly marked dorsal caruncle and has no bifid setae; a fully developed parapodium, with normal setae, in front of the somite (second) bearing the stout acicular setae.

SCALIBREGMA H. Rathke.

Nova acta Acad. Leop.-Car., 1843, **20**, p. 184; ASHWORTH, Quart. journ. micros. sci., 1902, **45**, p. 242, 296; MCINTOSH, British annelids, 1915, **3**, pt. 1, p. 33.
Oligobranchus SARS, Fauna litt. Norveg., 1846, **1**, p. 91.

SCALIBREGMA INFLATUM H. Rathke.

Nova acta Acad. Leop.-Car., 1843, **20**, p. 184, pl. 9, fig. 15–21; ASHWORTH, Quart. journ. micros. sci., 1902, **45**, p. 238.

Oligobranchus roseus SARS, Fauna litt. Norveg. 1846, **1**, p. 91, pl. 10, fig. 20–27.

Oligobranchus groenlandicus SARS, *Ibid.*, p. 92.

Scalibregma roseum SARS, Nyt mag. naturv., 1853, **7**, p. 381.

Scalibregma inflatum corethusa MICHAELSEN, Grönländ Annel., 1898, p. 127 (epitoke).

LOCALITY. Between Unalaska and Kadiak: Sta. 3337 (lat. 53° 55′ 30″ N., long. 163° 26′ W.). Depth 280 fms. Bottom temp. 39.3° F. 27 August, 1890. One specimen.

This is a widespread species occurring on both sides of the Atlantic in northern latitudes, and also in the northern Pacific, as well as in the far southern latitudes, such as the region about Prince Edward Island, Kerguelen, Strait of Magellan, and New Zealand.

ARENICOLIDAE.

In these annelids the body is elongate and cylindrical, is composed of numerous somites, and presents either two or three more or less distinct regions. Colors commonly greens or reds, with often superficial iridescence. The skin is characteristically tesselated, consisting of a thin cuticle covering a thick glandular hypoderm.

Prostomium small, or but moderately developed. Nuchal grooves posteriorly. No tentacles or palpi. Eyes primitive and indistinct.

The peristomium in most species bears a pair of otocysts. It is fused with a somite that early becomes achaetous.

In the setigerous region of the body each somite, excepting the first three, is composed of five distinct annuli excepting in Branchiomaldane, in which but two annuli are found.

The parapodia are obviously biramous, each presenting a conical notopodium bearing ordinary setae and a transversely thickened neuropodium bearing crochets.

Branchiae always absent from the first seven somites, and often from more. They are highly characteristic structures attached dorsally just mesad of the bases of the notopodia. Each is a hollow outgrowth which is highly branched in either a dendritic or pinnate manner, or the branches radiating from a common point like the ribs of a fan. The gills often more or less retractile.

Setae of the notopodia are all of the simple capillary type, smooth proximally, but distally bearing short, hair-like teeth, or processes, along the sides. In young specimens a second type of notopodial seta may occur, this being limbate, with an exceedingly fine tip. The neuropodial setae are stout crochets which are more or less curved and present a rostrate enlargement distally, which ordinarily shows teeth along the distal edge and may or may not exhibit a small subrostral spine suggesting the more prominent one, or the corresponding tuft of hair, occurring in those of the Maldanidae.

Five, six, or thirteen pairs of nephridia are present. In these there is the usual open ciliated nephrostome internally.

There are one or more pairs of glandular caeca opening into the posterior portion of the oesophagus. The pharynx is globular. It is unarmed, though it may have papillae tipped with chitin.

Gamble and Ashworth give an excellent general account of the family. (Quart. journ. micr. sci., 1900, **43**, p. 419–569, pl. 22–29).

The members of this group are more or less confined to shallow water. They normally occur in and above the Laminarian zone. They frequent sand and gravel in which they burrow, though the young forms are often found among Algae rather than in the sand. The tubes of *Arenicola marina*, are U-shaped and are stained on the inner side from the abundant yellowish green mucus exuded by the skin.

Speaking of *A. cristata* as observed by him at Charleston Harbor, Stimpson says: "It occurred in the third and fourth subregions of the littoral zone, living in holes in the hard sand, which it had excavated to a length of two feet. These holes were exactly adapted in width to the thickness of the animal, and were not furnished with a lining of any kind. They extended obliquely downward, being at first perpendicular, but curving so as to become almost horizontal; the lower extremity was about one foot below the surface.... All the specimens were found in their holes, with the anterior extremity downward, and when taken were trying to escape by digging still further into the sand, which is effected by continued rapid evolutions of the proboscis.... During the latter part of March, we frequently observed in and about the holes of these worms great quantities of a soft, transparent jelly, filled with minute brownish specks, which proved to be eggs." (Proc. Boston soc. nat. hist., 1855, **5**, p. 116.) The arenicolids are limivorous. The spiral castings are to be seen on the surface near the openings of their burrows. *Branchiomaldane vincenti*, a small form only 8–20 mm. long, lives in transparent mucus tubes attached to calcareous Algae at the Canary Islands and in the English Channel.

Savigny used the term Telethusa for this family, which is still often referred to as the Telethusae, or the Telethusidae.

Key to Genera.

a. Branchiae appearing only in the posterior region (somite 18–21); simple, bifid, trifid or quadrifid; hermaphroditic; otocysts absent.............................*Branchiomaldane* Langerhans.

aa. Branchiae beginning in the anterior region, branching more complex; dioecious; otocysts usually present, but in some absent.

b. A distinct tail present, the parapodia and branchiae not extending to the caudal end of the body; prostomium well developed, trilobed; branchiae pinnate, eleven to thirteen pairs, the first ones appearing on the seventh setigerous somite......................*Arenicola* Lamarck.

bb. No distinct tail, the parapodia and branchiae being continued to the caudal end of the body; prostomium simple and non-lobate; branchiae unilaterally branched, of variable number, the first ones appearing farther back on setigerous somite 12–16........*Arenicolides* Mesnil.

Arenicola Lamarck.

Anim. s. verteb., 1801, **5**, p. 324; Gamble and Ashworth, Quart. journ. micr. sci., 1900, **43**, p. 540.
Chorizobranchus Quatrefages, Hist. nat. annelés, 1865, **2**, p. 267.
Clymenides Claparède, Beobacht. anat. ent. wirbell. thiere, 1863, p. 30.
Pteroscolex Lütken, Vid. meddel. naturk. foren Kjobenh., 1864, p. 120.

Arenicola cristata Stimpson.

Proc. Boston soc. nat. hist., 1855, **5**, p. 114; Gamble and Ashworth, Quart. journ. micros. sci., 1900, **43**, p. 432.
Arenicola (*Pteroscolex*) *antillensis* Lütken, Vid. meddel. naturk. foren Kjobenh., 1864, p. 120.
Arenicola antillensis Ehlers, Mem. M. C. Z., 1887, **15**, p. 173.

Locality. Florida. Albatross, 1886.

One large specimen conforming fully to this species, which occurs along the south Atlantic Coast of the United States and in the Antilles, and has been taken as well at Naples.

FLABELLIGERIDAE.

In the members of this family the body is short, rarely exceeding seven or eight centimeters in length, with the number of somites mostly limited, rarely as many as ninety. The thickness of the body varies, but the general form is commonly fusiform, or more swollen anteriorly. The surface of the body is mostly covered with muciparous papillae, which are sometimes filamentous and at others clavate, with commonly a transparent coating of mucus, to which grains of sand adhere. This mucus when fresh, *i.e.*, the outer layers of it, is soluble in 5–10 per cent sodium carbonate, but not so the older, inner and colloidal layers. (Bles, Rept. Brit. assoc. 1892, 1891, p. 373).

The prostomium is small and often retracted into the peristomium. It bears a pair of palpi, which are in general grooved. Above, the tentacles or branchiae are short and filiform, and more or less numerous, always four or more, these extending forward about the prostomium and palpi. Eyes normally four, though easily overlooked because of the frequent retraction of the prostomium.

The peristomium is generally short, but it may be extended into a short and retractile tube. It is setigerous.

The parapodia are biramous, with setigerous papillae usually absent or obsolete, but sometimes distinct. No true cirri.

The setae are all characteristically strongly cross-striate, or annulated. They are of two principal types, slender capillary ones, and shorter, stout acicular ones, or crochets. The capillary setae are always simple; the crochets either simple or composite. The bristles of the first few somites in most cases are very long and directed forwards so as to form the so-called cage about the anterior end; these setae often have a special structure and a characteristic iridescence.

The nephridia are two tubes ending each in a *cul-de-sac* near the sides of the stomach and opening separately or by a common pore anteriorly near the mouth (Haswell, Proc. Linn. soc. N. S. W., 1892, ser. 2, **6**, p. 349).

The blood-fluid when seen in thin layers, or as it appears in the animals in life, is green, the color being due to a substance allied to haemoglobin and termed chlorocruorin. In quantity it is dark red. In alcohol, the blood commonly appears reddish.[1]

The alimentary tract presents anteriorly a narrow oesophagus with ciliated lining, behind this a wide, thin-walled stomach, with an anteriorly projecting coecum, followed by a narrow, thick-walled intestine, in which there is normally a more or less strongly marked sigmoidal flexure.

The flabelligerids live largely in muddy ground, or muddy sand, and in slime, at various though mostly small or moderate depths. They may occur between tide-marks on the one hand, while they may descend to great depths on the other, the remarkable Buskiella of the CHALLENGER expedition occurring at a depth of 2,500 fms. (McIntosh, Challenger Annelida, 1885, p. 372). The littoral forms are dominantly inhabitants of the colder regions. Thus, as Ehlers points out (Festsch. K. gesellsch. Göttingen, 1901, p. 179), of the nine species mentioned by Levinsen (Vidensk. meddel. foren. Kjoben., 1883, p 301) in his review of the flabelligerids of the North Sea, six are Arctic. Carus gives but three species from the Mediterranean; Grube in Semper's extensive collection from the Philippines found but one species of this family; Gravier lists one from the Red Sea; and Ehlers lists three species from the Magellan Strait, and one from the coast of Chile. Willey notes but one from Ceylon, Augener one from southwest Australia, and Izuka none from Japan. Professor Haswell mentions three from New South Wales. Of the five species secured by the ALBATROSS, one is from the Alaskan region, one from the Atlantic coast of the United States, and the others from off Mexico and Panama, but at depths of from 493 to 1,879 fms.

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[1] *Cf.* Lankester, Proc. Royal Soc., 1873, **21**, p. 2; McIntosh, British annelids, 1915, **3**, pt. 1, p. 85.

The flabelligerids swallow the muddy sand in which they live. In this material, when taken from their alimentary tracts, are found diatoms, shells of Radiolaria and Foraminifera, spicules of sponges, spines of such forms as Spatangus, fragments of Algae and other organic debris. Some are commensals, such as *Flabelligera commensalis* Moore, which occurs among the spines of *Strongylocentrotus purpuratus* in Monterey Bay (Moore, Proc. Acad. nat. sci. Philad., 1909, p. 288). They frequently themselves bear parasites attached to their setae, such as certain Fungi and stalked Infusoria, *e.g.*, Vorticellae and Carchesium. Internal parasites are also known, *e.g.*, the peculiar crustacean parasite (*Bradophyla pygmaea*) found by Levinsen in the anterior part of the alimentary canal of *Brada villosa*.

Key to Genera.

- *a.* Branchiae and tentacles borne on one or two conspicuous prolongations or stalks.
  - *b.* Branchiae arising from a single protrusible stalk. . . . . *Zorus* Webster and Benedict.
  - *bb.* Branchiae borne on two club-shaped or conical stalks.
    - *c.* Composite neuropodial setae present; branchiferous stalks conical. . . . . *Piromis* Kinberg.
    - *cc.* Setae all simple; branchiferous stalks club-shaped. . . . . *Coppingeria* Haswell.
- *aa.* Branchiae and tentacles not borne on stalks, or at most a moderate prominence bearing but part of the branchiae.
  - *b.* Bearing dorsally a conspicuous median, tentaculiform process, with a smaller lateral one each side just caudad of the mouth opening (occurring at great depths). . . . . *Buskiella* McIntosh.
  - *bb.* With no such median dorsal appendage.
    - *c.* Bristles of first two somites fine, in length and structure but little different from the rest, not forming a distinct "cage"; a pair of distinct genital papillae between the fourth and fifth setigerous somites. . . . . *Brada* Stimpson.
    - *cc.* Bristles of the first and generally also of the second and third somites mostly decidedly longer and stouter than the others, commonly directed forwards and forming a "cage"; no genital papillae between the fourth and fifth setigerous somites.
      - *d.* Body densely covered with long, filamentous, or hair-like papillae.
        - *e.* Notopodial setae all capillary and smooth.
          - *f.* Neuropodial setae in form of short, stout, hooked crochets; numerous branchial filaments on each side of head; anterior setae forming a distinct "cage". . . . *Flabelligera* Sars.
          - *ff.* Neuropodial setae numerous, very long and stout, not crochet-formed; not with numerous branchial filaments each side of head; anterior setae not forming a distinct "cage"; body very broad in proportion to length. . . . . *Ilyphagus*, gen. nov.

ee. Notopodial setae in part capillary and finely biserrate, or plumose, and in part bidentate crochets. . . . .*Pantoithrix*, gen. nov.[1]
dd. Papillae not filamentous and dense, mostly shorter, coarser, and fewer, and sometimes sparse and inconspicuous.
  e. Setae all capillary in both neuropodia and notopodia, or rarely a few small crochets in a few of most caudal somites only.
  Branchiae few, definite, typically eight in number, with four long and four short, elevated above the tentacles. . . . .*Saphobranchia*, gen. nov.[2]
  ee. Crochets present in the neuropodia, or in all excepting the most anterior.
    f. Crochets on certain somites (in the genotype V–VIII) composite.
    Conspicuously constricted between the second and third setigerous somites. *Therochaeta*, gen. nov.[3]
    ff. Crochets all simple.
      g. Crochets with a distinct subapical spur or spine.
      Branchiae numerous, in a U-shaped group. . . . .*Balanochaeta*, gen. nov.[4]
      gg. Crochets all with tips entire, no spur or subapical process.
        h. Branchiae eight or ten arranged in two equal and parallel rows, one behind the other and caudad of tentacles. . . . .*Flemingia* Johnston.[5]
        hh. Branchiae numerous, short and equal.
          i. Borne upon the anterior surface of a membranous lobe vertically elevated caudad of the tentacles. . . . .*Semiodera*, gen. nov.[6]
          ii. Borne upon the edge of a membranous rim in a U-shaped group. *Stylariodes* Delle Chiaji.[7]

Synonymy of Genera.

In this tabulation of genera it has been impossible to make sure that all species that have been described are included, because of the meagreness of many accounts. However, it has seemed best so far as possible to break up the manifestly heterogeneous assemblage of species that have been accumulated under Stylarioides along lines suggested by Marenzeller and St. Joseph, since accumulating evidence shows that these groups are natural as well as convenient.

Reexamination is necessary to remove all doubt as to the status of Zorus Webster and Benedict.

The name Trophonia is still often used either in the same sense as Stylarioides, or to designate a different but closely related group of species. The name, however, cannot be used since *T. barbata* Audouin and Milne Edwards (Cuvier), its type-species, is a synonym of *S. moniliferus* Delle Chiaji, the type of Stylarioides. Pherusa Oken, from which the family has sometimes been called the Pherusidae, cannot be used for this genus because the name is preoccupied in the Crustacea.

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[1] GENOTYPE, *Pherusa chilensis* Schmarda. *παντοῖος*, of all sorts, and *θρὶξ*, hair.
[2] GENOTYPE, *Stylarioides longisetosa* Marenzeller. *σαφὴς*, distinct, definite, and *βράγχια*, gill.
[3] GENOTYPE, *Stylarioides collarifer* Ehlers. *θαιρὸς* hinge, articulation, and *χαίτη*, seta.
[4] GENOTYPE, *Trophonia eruca* Claparède. *βάλανος*, a clasp or snap, and *χαίτη*, seta.
[5] GENOTYPE, *F. muricata* Johnston (*F. plumosa* Müller).
[6] GENOTYPE, *Siphonostoma cariboum* Grube. *σημαία*, a standard, and *δέρη*, neck.
[7] GENOTYPE, *S. moniliferus* Delle Chiaji.

Flabelligera Sars.

Bidrag til Söedyr. nat., 1829, **1**, p. 31.
Siphostoma Otto, Nova acta Acad. Caes. Leop. nat. curios., 1820; Cuvier, Règne anim., ed. 3, 1830, **3**, p. 196 (*nom preocc.*).
Chloraema Dujardin, Ann. sci. nat., 1839, ser. 2, **11**, p. 288.
Siphonostomum Grube, Actin. echin. würmer Mittelmeere, 1840, p. 68; Rathke, Nova acta Acad. Leop.-Car., 1843, **20**, p. 208.
Siphonostoma Leuckart, Archiv naturg., 1849, **15**, p. 164 (*nom preocc.*).
Lophiocephalus Costa, Ann. sci. nat., 1841, **16**, p. 276.
Tecturella Stimpson, Invertb. Grand Manan, 1853, p. 32, pl. 3, fig. 21.
Chloraemum Sars, Nyt mag. naturv., 1873, **19**, p. 247.

Flabelligera infundibularis Johnson.

Proc. Boston soc. nat. hist., 1901, **29**, p. 417, pl. 12, fig. 124–127.

The specimens referred to this species are in a bad state of preservation, but they seem to conform to the description in so far as the characters can be made out. The species was found originally in Scow Bay, in the Puget Sound region, where it was abundant. "This worm seemed to occur in a layer along the somewhat muddy bottom, for bushels of this jelly-like mass exclusively were brought up from a region half an acre in extent" (Harrington and Griffin, Trans. N. Y. acad. sci., 1897, **29**, p. 162). Some of the Scow Bay specimens came from a depth of not more than six fathoms, but data on others were lacking. The Alaskan specimens here recorded came from a greater depth. Their long black-tipped ventral hooks and the long pedicillate papillae are conspicuous features.

Locality. Between Unalaska and Kadiak: Sta. 3337 (lat. 53° 55′ 30″ N., long. 163° 26′ W.). Depth 280 fms. Bottom of green mud and rock. Bottom temp. 39.3° F. Two specimens dredged 27 August, 1890. They are at present free from any enclosing jelly-like mass.

Flabelligera affinis M. Sars.

Bidrag. til Söedyr. nat., 1829, **1**, p. 31, pl. 3, fig. 16; McIntosh, Brit. annelids, 1915, **3**, pt. 1, p. 107.
Chloraema edwardsii Dujardin, Ann. sci. nat., 1839, ser. 2, **11**, p. 288, pl. 7, fig. 1–5.
Siphonostomum papillosum Grube, Actin. echin. würmer Mittelmeere, 1840, p. 68.
Lophiocephalus edwardsii Costa, Ann. sci. nat., 1841, **16**, p. 276.
Siphonostomum vaginiferum, Rathke, Nova acta Acad. Leop.-Car., 1843, **20**, p. 211, pl. 11, fig. 3–10.
Siphonostoma uncinata Milne Edwards, Cuvier's Règne anim. Annél., 1843, p. 27, pl. 6, fig. 4, 4a.
Siphonostoma vaginifera Leuckart, Archiv naturg., 1849, **15**, p. 164.
Chloraema dujardini Quatrefages, Ann. sci. nat., 1849, ser. 3, **12**, p. 282, pl. 9, fig. 1–9.
Chloraema sordidum Quatrefages, *Ibid.*, 1849, ser. 3, **12**, p. 285, pl. 9, fig. 10.
Siphonostoma gelatinosa Dalyell, Pow. creat., 1853, **2**, p. 256, pl. 18, fig. 10–12.
Tecturella flaccida Stimpson, Invertb. Grand Manan, 1853, p. 32, pl. 3, fig. 21.
Siphonostomum diplochaitos Kölliker, Kurz. bericht., p. 10, 17, pl. 6, fig. 7.
Chloraemum pellucidum Sars, Nyt mag. naturv., 1873, **19**, p. 247.
Siphonostomum gelatinosum Gibson, Proc. Lit. philos. soc. Liverpool, 1886, **40**, p. 158.

LOCALITY. Atlantic Coast: Between Cape Hatteras and Nantucket. Sta. 2291 (lat. 35° 25′ 30″ N., long. 75° 20′ 30″ W.). Bottom of broken shell and grey sand. Depth 15 fms. 20 October, 1884. Two specimens.

This species is common on the North Atlantic Coasts of Europe and America, where it is often found between tide-marks. It also occurs in the Bering Sea and American Coast of the Northern Pacific.

BRADA Stimpson.

Invertb. Grand Manan, 1853, p. 32; McIntosh, British annelids, 1915, **3**, pt. 1, p. 103.

BRADA VERRUCOSA, sp. nov.[1]

Plate **68**, fig. 3–6.

Body subclavate, being widest at about one fourth the length from the anterior end, and then narrowing conspicuously into a slender posterior region. Most slender a little distance in front of the caudal end, which may be somewhat spatulate. One specimen 60 mm. long has a maximum width of 6.5 mm. and a minimum diameter in the posterior region of 2.5 mm. The segments in the anterior and middle regions of the body do not vary much in length, but in the caudal fifth, or thereabouts, they decrease decidedly caudad and at the end are very short and crowded. The dorsal surface is strongly convex, as usual, while the ventral is complanate and over the caudal nine or ten somites marked by a distinct median longitudinal groove. Somites forty-nine to fifty-two. The maximum length in the type-specimens is about 80 mm.

The prostomial region is retracted in the usual way, leaving the common trifid opening, projecting from which in some specimens may be seen the tips of the tentacles and palpi. The palpi are rather narrow, sublanceolate, contracting to a narrowly rounded tip; dorsal surface smooth; ventrally with the usual median longitudinal furrow, the surface on each side of this being transversely folded or wrinkled. (Plate **68**, fig. 3). The tentacles are slender, filiform, a considerable number on each side, though it was impossible to determine the number accurately.

The papillae of dorsal surface high and stout, subconical, apically rounded and hard, as in *B. mammilata* Grube. They are not arranged in regular longitudinal series. In the anterior and middle region the tubercles are mostly in

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[1] verrucosus, covered with warts.

two, or, less commonly, three, irregular transverse rows on each segment, becoming fewer caudad, there being on somites toward the caudal end usually but one transverse row. The tubercles are highest and most crowded in the widest region of the body, becoming lowest and sparsest in the caudal region. There are no tubercles on the sides of the body between the parapodia. The venter is also wholly smooth.

Neuropodial setae somewhat reddish brown, inserted in a prominent tubercle, the fascicle usually consisting of four setae. These setae are relatively short, being shorter than the somite to which they pertain, and the most ventral one commonly abruptly shorter than the adjacent one, the others ordinarily differing but little, or decreasing a little from the most dorsal ventrad. They are straight, or but slightly curving distally. Annuli of setae moderate in length, shortest proximally, often a longer annulus occurring at intervals between those of ordinary length. (Plate **68**, fig. 4). Notopodial setae pale, much longer and much more slender than the neuropodials, straight, or a little curving in the very fine distal region. Annuli long, longest at the distal end, as shown in the figures. (Plate **68**, fig. 5, 6).

LOCALITY. Off Mexico: Sta. 3417 (lat. 16° 32′ N., long. 99° 48′ W.). Depth 493 fms. Bottom of green mud. 11 April, 1891.

This species suggests *B. mammilata* Grube, occurring at Kerguelen and other far southern localities. The present species is a larger form, with more numerous segments and larger dorsal papillae. The neuropodial setae are fewer in a fascicle, relatively shorter, with annuli conspicuously longer.

BRADA IRENAIA, sp. nov.[1]

Plate **68**, fig. 7–9; Plate **69**, fig. 1–3.

Body consisting of forty or forty-one setigerous somites. The type-specimen, in which the prostomium is extended, is narrowest anteriorly, a little constricted at the second and third somite, then widening gradually to about the twelfth setigerous somite, remaining then of uniform width, or narrowing but little, to about the thirty third somite, from where it narrows moderately to the rounded caudal end. Segments of median region longest. Dorsal surface strongly convexly arched. Ventral surface between parapodia flattened, more strongly so caudad, and over the caudal third of length showing a median longitudinal furrow. Total length, about 44 mm. Greatest width, near 5 mm.

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[1] εἰρηναῖος, pacific.

The palpi are short, flattened and broad, widest above base and narrowing to the tip, oblong-ovate. With the usual distinct longitudinal groove along the ventral surface from base to tip. The tentacles have been so far rubbed off that their number could not be ascertained. The mouth in the extended condition of the prostomium shows as an arcuate slit, the two halves of the bow being concave ventrally; the lining membrane somewhat ridged or wrinkled.

Dorsal surface densely papillose, the papillae in the present contracted condition touching each other, or nearly so. There are mostly from three to five of these in the length of a somite. When extended the papillae appear to be elongate, conical, or more or less flattened in the anterocaudal direction. Ventral surface similarly with numerous papillae, which when extended are in part elongate and more or less filiform. Sides also equally densely papillose between the parapodia.

Both neuropodial and notopodial setae in the median region are relatively long and in conspicuous tufts borne each on a well-developed tubercle. The notopodial setae are decidedly more slender than the neuropodials, though not much differing in length. They are very fine distally, where they are curved, often uncinately so. They are annulate throughout their length, excepting the fine tip. They are finer and more curved on the anterior somites. The annuli are decidedly longer at the base than in *B. villosa*, increasing in length distad as shown in the figures. (Plate 68, fig. 7–9). Neuropodial setae stout and straight, ending in a transparent, abruptly more slender tip. Setae below, or proximad of, tip strongly annulate. The annuli uniform or shorter distad, all relatively broader and shorter than those of the notopodials. (Plate 69, fig. 1–3). Setae mostly five to eight in a fascicle.

Genital papillae between fourth and fifth somites elongate, slenderly subconical.

Locality. Off Panama: Sta. 3382 (lat. 6° 21′ N., long. 80° 41′ W.). Depth 1,793 fms. Bottom of green mud. 7 March, 1891. One specimen.

This species seems to be near *B. villosa* (Rathke), a form occurring widely in the North Atlantic and Arctic regions and also recorded from the North Pacific. A comparison with a specimen of *villosa* from Spitzbergen, however, shows the forms to be clearly distinct in the character of the setae. In the middle segments of the present species the neuropodial and notopodial setae are more nearly of the same length, and the notopodials are proportionately stouter. The neuropodials are decidedly longer in relation to the length and breadth of the somites. A very conspicuous difference is the decidedly greater length of the annuli in the setae.

ILYPHAGUS, gen. nov.[1]

Body broad in comparison with length, rounded at both ends, at neither of which it is otherwise much attenuated.

Characters of prostomium unknown.

Parapodia biramous, without obvious setigerous prominences.

Setae all simple, strongly cross-striate, or annulated, as usual. Those of the notopodial fascicles capillary, very fine, uniform. Those of the neuropodia very much coarser, straight, or nearly so, long, narrowing to a fine tip, not in crochet-form. The setae of the most anterior somites not specially elongate and not forming a "cage."

The surface of the body densely clothed with hair-like filaments, more or less uniformly arranged, and completely cloaking the body. Integument non-tuberculate.

GENOTYPE.— *I. bythincola,* sp. nov.

Differing from Brada in lacking a tuberculated integument and in being densely and uniformly clothed with long, fine filaments. The neuropodial setae are relatively much larger and are not suggestive of the crochet-type.

ILYPHAGUS BYTHINCOLA, sp. nov.[2]

Plate **69**, fig. 4–9.

The three type-specimens are deformed by pressure. All are densely clothed with closely adherent mud. The anterior end is retracted, preventing satisfactory examination of the prostomium and its appendages.

The largest specimen is 50 mm. long, and in its present flattened condition measures 25 mm., or half the length, across the middle. The number of somites, while not precisely determinable, is small, not exceeding forty.

The entire body is covered with a dense, felt-like coat of slender, hair-like, uniform, cuticular filaments. The ventral setae are conspicuously coarser than the dorsals. They are yellow, or somewhat straw-colored. In the middle region eight, or about that number, in each fascicle. Each seta narrows continuously and conspicuously distad, being drawn out into a long, fine, straight, or somewhat curved, tip. The seta also narrows toward the base. The annuli are short and strongly marked; as usual, they become proportionately longer distad, though the absolute increase is not great and the relative increase not so great as frequent in species of related genera. (Plate 69, fig. 7–9). The dorsal setae have a similar structure, but are very much finer, with the annuli commonly longer. (Plate 69, fig. 4–6). The specimens give no evidence of the longer special setae such as form a head-cage in most genera.

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[1] *'ιλὺs*, mud, and *φάγος*, a glutton.

[2] *βυθὸs*, deeps of the sea, and incola, inhabitant.

LOCALITY. Off Mexico: Sta. 3415 (lat. 14° 46′ N., long. 98° 40′ W.). Depth 1,879 fms. Bottom of green mud and Globigerina ooze. 10 April, 1891. Three specimens.

ILYPHAGUS PLUTO, sp. nov.

This is a smaller and notably more slender species than the preceding, subcylindrical, moderately narrowed cephalad, the anterior end a little obliquely truncate, while at the posterior end the body is abruptly narrowed so as to present a short, much narrower, caudal region.

Surface covered with filaments as in the preceding species, but these less dense and rather coarser proportionately. Adhering to this coat was much foreign material, including, *e.g.*, shells of Foraminifera.

Around the margin of the truncate anterior end, which has a diameter of 8 mm., is a series of twenty stout, cylindrical processes distally divided into short rounded lobes, these being apparently retracted branchiae; the processes are laterally contiguous and form a completely closed circle.

Whereas in *bythincola* the coarse ventral setae are pale straw colored throughout, in the present species they are much darker, reddish brown or sorrel-colored, excepting the extreme tips, which are pale. They are long and stout and terete, excepting at the tips, where they are flattened and moderately curved, with acute apex. In middle region of body, 19 mm. long. Notopodials also red-colored; smaller than the neuropodials, but much coarser in proportion than in *bythincola*. Setae of anterior region lost.

Length, 42 mm.; width, 11.5 mm.

LOCALITY. Off Peru: 88 m. S. W. of Palominos Light House. Sta. 4672 (lat. 13° 11′ 30″ S., long., 78° 18′ W.). Depth 2,845 fms. Bottom of fine dark green mud. Bottom temp. 35.1° F. 21 November, 1904.

ILYPHAGUS ASCENDENS, sp. nov.

In general appearance much more resembling *bythincola* than the preceding species. The type is a little longer than those of *abyssicola* and is more uniform in width, not so noticeably widening toward one end. Rounded at the ends.

Body densely clothed with slender filaments forming a thick coat, as in the other species.

The neuropodial setae are pale brown, being a little darker than in *bythincola.* Whereas in the latter species the neuropodial setae are apparently of nearly equal stoutness throughout the length of the body, in the present species they become very much more slender caudad, the long anterior ones being very much coarser than the most posterior ones. Most setae in the type are broken off near the base; the longest anterior one, which is distally incomplete, is in the present condition 44 mm. long, so that originally it must have approached the body in length. Notopodials very fine and short, pale.

Length, 55 mm.; greatest width, 22 mm.

LOCALITY. Galapagos: off Hood Island, 12 miles S. E. of Ripple Point. Sta. 4649 (lat. 1° 35′ S., long. 89° 30′ W.). Depth 633 fms. Bottom of light grey Globigerina ooze. Bottom temp. 39.5° F. 10 November, 1904.

STERNASPIDAE.

These are highly specialized polychaetes, of very distinctive appearance. The body is short, consisting in superficial appearance of 19–22 somites, but morphologically, as judged by the number of fasciae of setae in the posterior region, composed of thirty-one somites (*S. scutata* Rietsch, Ann. sci. nat., 1882, **13**, p. 7; Vijdevsky, Densk. Akad. wissen. Wien, 1882, **43**, p. 35). Of these, fifteen lie in front of the ventral shield, a characteristic double horny, but not truly chitinous (Goodrich, Quart. journ. micr. sci., 1898, **40**, p. 239) plate or shield, from the edges of which radiate fasciae of long setae on the ventral surface at the posterior end of the body. The first seven somites in the state of repose are retractile. The integument in general is covered with numerous fine, hair-like papillae, which are typically more numerous and coarse caudad of the seventh somite. The integument caudad of this somite is commonly also longitudinally furrowed, or striate. To the surface adhere numerous, chiefly silicious, particles, much as in the Flabelligeridae.

The prostomium is a very small rounded lobe just over, or in front of, the mouth. It bears neither eyes nor appendages.

Peristomium, or first somite, without setae.

The anus opens on a papilla above the ventral shield.

On each side of and above the anal papilla are two dense bundles of long, filamentous branchiae arising from a plate or shield through perforations in which they pass.

No parapodial processes. Each of somites II, III, and IV with a long row of stout acicular setae, or spines, on each side; the distance between the ends of the lateral series above and below increases from somite II to somite IV.

No setae on somites V, VI, and VII. Setae of somites VIII to XV, inclusive, are abortive, ordinarily not emerging through the cuticle. The remaining somites have fasciae of long simple setae which radiate from the edges of the shield, there being (at least in *S. scutata*) seventeen pairs of these fasciae.

The nephridia are in the form of a single pair of tubercles provided with small, ciliated, internal funnels and nephrostomes, but without external openings. The gonads are represented by a trilobed sac with two ducts, each of which opens at the tip of a slender genital process at the anterior ventral edge of somite VIII (Goodrich, *Op. cit.*, p. 233, pl. 15, fig. 1, etc.). The alimentary canal is conspicuously coiled. The pharynx is a conspicuous bulbous division followed by a slender oesophagus. The stomach is much thicker and dilatable, and is followed by a slender intestine which terminates in an expanded rectum. A remarkably long, two-branched proboscis, which is easily lost, has been described for *S. spinosus* (Sluiter, Naturk. tijds. Neederl. Indie, 1882, **41**) and may be present in life in all.

These worms have various structural characters suggesting the Echiuroidea, with which group they have often been connected, *e.g.*, by Carus, Gegenbaur, and Huxley. In fact, *scutata*, the first and best known species, was placed by Ranzani in the genus Thalassema; and when Otto made a new genus for it he sought to recall the supposed resemblance by changing the specific name to *thalassemoides*. Otto, Meckel, and Cuvier regarded Sternaspis as an echinoderm.

The species of Sternaspis, the only genus thus far known, live mostly on muddy bottoms, at depths between 15 and 628 fms. *S. major*, a new species (p. 406), having been taken at the latter depth.

STERNASPIS Otto.

Nova acta Acad. Caes. Leop. nat. curios., 1821, **10**, pt. 2, p. 619.

STERNASPIS FOSSOR Stimpson.

Invertb. Grand Manan, 1853, p. 29, pl. 2, fig. 19; VERRILL, Invertb. Vineyard Sound, 1873, p. 507, 606, pl. 14, fig. 74; LEVINSEN, Öfvers. Nordiske Annulata, 1883, pt. 2, p. 214; MARENZELLER, Ann. Naturhist. mus. Wien, 1890, **5**, p. 5, pl. 5, fig. 4–4b, 5, 5a, 7; AUGENER, Bull. M. C. Z., 1906, **43**, p. 191.

Sternaspis affinis Stimpson, Proc. Acad. nat. sci. Philad., 1864, p. 159.
Sternaspis assimilis Malmgren, Annulata Polychaeta, 1867, p. 87.
Sternaspis islandica Malmgren, *Op. cit.*, 1867, p. 87, pl. 14, fig. 85.
?Sternaspis fossor Johnson, Proc. Bost. soc. nat. hist., 1901, **29**, p. 418; Moore, Proc. Acad. nat. sci. Philad., 1908, p. 191.
Sternaspis costata Marenzeller, Denk. K. acad. wissensch. Math.-nat. klasse, 1879, **41**, p. 142, taf. 6, fig. 4.

This species, as at present conceived, is widespread in the north Atlantic and Pacific Oceans, at moderate depths.

Locality. Gulf of Panama: Sta. 3391 (lat. 7° 33′ 40″ N., long. 79° 43′ 20″ W.). Depth 153 fms. Bottom of green mud. Bottom temp. 55.8° F. 9 March, 1891. Ten specimens.

STERNASPIS MAIOR, sp. nov.[1]

Plate **78**, fig. 10.

The type is badly broken, so that only the ventral plate or shield can be satisfactorily studied. This plate, however, presents differences in structure and is so much larger than that of *S. fossor* Stimpson, occurring off the coast of British Columbia and Alaska and than the very closely related *S. scutata* (Ranzani), occurring off Alaska and Japan, as well as in the Atlantic and Mediterranean, that it seems obviously a distinct species. The plate is 15 mm. wide, with a length along the median suture of 7 mm. and toward the ends of about 7.75 mm., the ratio of width to average length being two to one. The plate is heavier and the sculpturing obviously coarser than in *S. scutata* or *S. fossor.* Each half of the anterior margin is straight, the two meeting at the middle in a very obtuse reentrant angle. The ends are nearly evenly convex, with both the anterior and caudal corners narrowly rounded. The caudal margin is nearly straight, the inner portion of each half a little convex. The median longitudinal furrow is deep and rather wide posteriorly. A strong ridge, beginning as a broad fold at each caudolateral corner, runs obliquely across the half plate, narrowing to a very fine point at the median line close to the caudal edge of the anterior whitish part. Bordering this ridge on the caudomesal side is a deep and wide furrow, the caudomesal region between this and the median furrow being moderately convexly elevated and crossed by four much weaker furrows parallel to the coarser one just mentioned. The region in front of each of the coarse oblique ridges running from each caudolateral corner is also crossed by weaker, but still very distinct, transverse furrows. (Plate 78, fig. 10).

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[1] magnus, large.

The marginal fasciae about the ventral plate have the setae of the usual general form. These are relatively shorter and stouter than in *S. scutata*. They have the usual hairy covering.

The branchial plates are proportionately broader than in *S. scutata*, and are much less flattened, being conspicuously convex.

Branchiae numerous, densely arranged and very fine.

Locality. Gulf of California: Sta. 3437 (lat. 27° 39′ 40″ N., long. 111° 0′ 30″ W.). Depth 628 fms. Bottom of brown mud with black specks. Bottom temp. 40° F. 23 April, 1891. One imperfect specimen.

MALDANIDAE.

The body of the maldanids is cylindrical, smooth, and proportionately elongate. It is of nearly uniform diameter throughout, though sometimes slightly narrowing caudad. The somites are for the most part elongate and few in number, ordinarily twenty-six or twenty-seven, and but rarely exceeding thirty. Three divisions may be seen, in the anterior of which the parapodia are found on the cephalic part of the somites, while in the succeeding somites the parapodia are shifted to the caudal border. The coloration is often varied, tints of red, yellow, and brown being frequent; several of the most anterior somites have ordinarily a different color from the rest of the body.

The prostomium lacks appendages or prominences, excepting that it may possess marginal elevations of limbi, which are entire or dentate, and a median keel, on each side of which are the nuchal furrows, which are often bowed, but sometimes straight.

The peristomium is achaetous and devoid of processes, except that it may have a more or less prominent dorsal lamina. It is fused with the prostomium.

The parapodia are biramous. They lack cirri or other processes.

Branchiae are never found on the anterior region, though very exceptionally there may be developed on some of the caudal somites short and simple branchiform processes.

The notopodial setae are simple and capillary and present much variety in form, being limbate, pinnate, or spined; commonly an anterior and a posterior group, with sometimes a small ventral one. The neuropodial setae are acicular or crochet-formed, and are arranged in either simple or double rows down the side of the body. The free part of the crochet presents typically a more or less narrowed region, or cervix, distad of which the crochet bears a number of teeth, with a larger one at the angle more or less curved toward the shaft. Ordinarily under the large tooth is a hair, or a group of hairs, which embrace or partly cloak it. In the *Heteromaldaninae*, subfam. nov.,[1] the crochets are dorsal and the capillary setae ventral.

A number of the preanal somites may be achaetous.

The anus is either terminal or more or less dorsal. There may be a median process of varying development beneath it. The anal somite may be simple or it may be developed into a funnel, which may be entire, toothed, or more or less incised into cirriform processes.

The alimentary canal is straight. There is a proboscis ordinarily well developed.

The nephridia open near the lowermost crochets, or less commonly near the upper part of the rows.

Maldanids are easily broken, and specimens with anterior or posterior regenerated ends are frequently met with.

The maldanids construct tubes which have walls that are often thick and which may be composed of mud, sand, shells of Radiolaria and Foraminifera and similar materials upon a thin, membranous lining, or sometimes the tube without foreign material occurs in empty mollusc shells, etc. They occur in the crevices of rocks, in mud or muddy sand, etc. They are found, on the one hand, in shallow water, in the beds of Zostera and similar places, and, on the other hand, down to great depths, *Sonatsa meridionalis* (p. 416), coming from a depth of 2,222 fms, and *Nichomache benthaliana* having been dredged by the Challenger from 2,300 fms.

Commensals and parasites on the maldanids are not rare. Thus McCann (Bull. scient. 1888, **19**, p. 421) records the copepod *Hersilionides pelseeneri* Canu (*Antheria latericia* Grube) as a commensal in the tubes of *Euclymene lumbricoides* Quatrefages. Nordmann (Bull. Soc. nat. Moscou, 1864, **37**) records another copepod, *Donusia clymenicola*, as a parasite on a maldanid, *Nichomache lumbricalisa;* and Levinsen (Viden. meddels., 1878, p. 360, pl. 6, f. 1–4) notes the occurrence of the copepod, *Rhodinicola elongata*, on the dorsum of *Rhodine loveni* Malmgren; certain annelidicolous members of Loxosoma also occur on maldanids (Prouho, Compt. rendus Acad. sci., 1890, **110**, p. 799).

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[1] For Heteromaldane Ehlers.

Key to the Subfamilies and Genera.

a. Cephalic plate absent.
b. Nuchal organs forming a semicircular bow.
c. Collar-somite and double rows of uncini present.......... *Rhodininae.* *Rhodine* Malmgren.
cc. No collar-somite or double rows of uncini present....................... *Lumbriclymeninae.*
d. Anus terminal.
e. Somites very numerous.. *Praxillura* Verrill.
ee. Somites not very numerous................................. *Lumbriclymene* M. Sars.
dd. Anus dorsal... *Notoproctus* Arwidsson.
bb. Nuchal organs forming a more or less open bow, or nearly straight........... *Nichomachinae.*
c. Anal cirri present.. *Nicomache* Malmgren.
d. Floor of anal cup strongly inclined...................... Subgen. *Loxochona* Arwidsson.
dd. Floor of anal cup but little inclined...................... Subgen. *Nicomache sens. str.*
cc. No anal cirri... *Petaloproctus* Quatrefages.
aa. Cephalic plate present.
b. Crochets in neuropodia and capillary setae in notopodia as usual; all but anterior parapodia on the posterior region of somites.
c. Anus terminal.. *Euclymeninae.*
d. Anal cirri numerous, but none strictly ventral............................ *Proclymenini.*
e. Free cephalic margin strongly developed all around............ *Maldanella* McIntosh.
ee. Free cephalic margin absent, or but weakly developed and wholly lacking posteriorly.
f. Four spine-bearing somites................................ *Proclymene* Arwidsson.
ff. Three spine-bearing somites................................ *Isocirrus* Arwidsson.
dd. Anal cirri none, or else with one strictly ventral.
e. A triangular glandular area on the ventral surface of the eighth setigerous somite.
Leiochonini. *Leiochone* Grube.
ee. No such triangular glandular area beneath on the eighth setigerous somite... *Eucylmenini.*
f. Eighth setigerous somite short, parapodia near or in front of the middle.
g. Anal cirri none or few................................ *Microclymene* Arwidsson.
gg. Anal cirri numerous.
h. Nuchal organs short.............................. *Pseudoclymene* Arwidsson.
hh. Nuchal organs not especially short.
i. With lateral glandular areas in front of first setigerous somite.
Heteroclymene Arwidsson.
ii. No lateral glandular areas in front of first setigerous somite.
j. With a funnel-shaped anal depression, from the bottom of which the cone arises.
k. Numerous ventral setae present on somites 1–3..... *Paraxiothea* Webster.
kk. Ventral setae on somites 1–3 occurring singly......... *Euclymene* Verrill.
jj. With no funnel-shaped anal depression................ *Iphianissa* Kinberg.
ee. Eighth somite long, with its parapodia posterior in position........ *Caesicirrus* Arwidsson.
cc. Anus dorsal.
c. Uncini all in single vertical rows.. *Maldaninae.*
d. Cephalic keel pronounced, long and high............................ *Maldane* Grube.
dd. Cephalic keel weak.. *Asychis* Kinberg.
cc. Uncini on some somites in two or three rows...................... *Sonatsinae,* subfam. nov.
Cephalic keel pronounced; no dorsal glandular area on somite 5............ *Sonatsa,* gen. nov.
bb. Crochets in a single series in all notopodia, the neuropodial setae exclusively capillary; parapodia anterior in position on all somites............................ *Heteromaldaninae,* subf. nov.
Heteromaldane Ehlers.

In this key I have adopted, in general, the classification developed by Arwidsson in his excellent monographic study of the family (Zool. jahrb. Suppl., 1907, **9**, heft. 1).

Synonymy of Genera.

Leiocephalus Quatrefages (non Gray, 1827) is the same as Leiochone Grube, as is also Clymenura Verrill.

Praxillela Verrill is regarded as synonymous with Iphianissa Kinberg.

Clymene Savigny, being preoccupied (Oken, 1815), has been replaced by Euclymene Verrill, and Praxilla Malmgren, antedated by Praxilla Reichenbach (Aves, 1853), has been replaced by Iphianissa Kinberg.

Chrysothemis Kinberg (non Berendt, 1845), Sabaco Kinberg, and Maldanopsis Verrill are synonyms of Asychis Kinberg.

Neco Kinberg belongs in the subfamily Lumbriclymeninae near Notoproctus, but is not completely enough known to be equated or placed precisely.

In the Nichomachinae, according to Arwidsson, who has examined the types, belong Mandrocles Kinberg (*M. architectus*), a form with long capillary setae, and Mylitta Kinberg (*M. quinquemaculata*). The latter name is preoccupied (d'Orbigny and Reclus, Moll., 1850) and may be disregarded.

Johnstonia Quatrefages probably belongs in the tribe Euclymenini of the Euclymeninae, but its precise identity is as yet in doubt.

Axiothea Malmgren, being preoccupied (Pascoe, 1864), gives way to Paraxiothea Webster (1879), of which Clymenella and Axiothella of Verrill are also synonyms.

PETALOPROCTUS Quatrefages.

Hist. nat. annelés, 1865, **2**, p. 247; ARWIDSSON, Zool. jahrb. Suppl., 1907, **9**, heft. 1, p. 113.
Nicomachella LEVINSEN, Vidensk. meddel. foren. Kjoben., 1884, 1883, p. 141.

PETALOPROCTUS CRENATUS, sp. nov.

Plate 73, fig. 3–7.

In the type, shrinkage has resulted in producing marked constrictions between the somites, the body thus presenting an almost moniliform appearance.

No non-setigerous somite in the posterior region. Penult and antepenult somites abruptly much shorter than those preceding. The penult somite not clearly separated from the anal. Only a small fascicle of capillary setae on the ultimate somite, no uncini occurring.

Anal somite bearing setae of the usual type at the anterior end, clavately enlarging caudad, with the dorsal line convex and the ventral slightly concave. The free border or limbus of the anal funnel is dorsally almost obliterated, being there straight and transverse. The lateral portion forming an abrupt angle with the dorsal and abruptly increasing in height, evenly continuous with the ventral portion. The funnel thus appears to have an oblong piece cut out from the dorsal side. The free edge of the elevated lateral and ventral region of the funnel is distinctly crenate, the edges of the part bordering the dorsal excavation smooth. Floor of funnel obliquely inclined, as usual, with the anus well toward the caudal edge. (Plate **73**, fig. 3, 4).

Uncini of median and posterior segments moderately bent at neck; shoulder distinct; side beneath main hook straight, the opposite one convex. Hooks or teeth normally four, of which the major one is wholly straight and is at right angles to the adjoining edge of neck, the other three teeth being half erect and decreasing in size toward the back of the crown, as usual. No subrostral tooth or angle. Subrostral hairs six or eight in number. Minor hooks fibrous, some fibers extending into the base of the major hook as well. (Plate **73**, fig. 6, 7). On the penult somite of the type nine uncini were counted in the torus; on the antepenult and adjacent somites the number varies from thirteen to fifteen, the number rising to about twenty farther forwards. The major capillary setae are slenderly acuminate, with exceedingly fine, long, smooth tips. Below the tip in each there are narrow wings, or limbi, which are finely ribbed, the oblique fibers appearing like series of closely arranged hairs. The limbi disappear in the middle region in going proximad, where the shaft attains its full width. Middle and proximal regions of seta wholly smooth. (Plate **73**, fig. 5). The finer setae have a similar structure and appearance, excepting for smaller size. The medulla of the setae presents the usual fibrillar structure.

The tubes are attached to partly carbonized fragments of wood, and have a winding form, as usual, in one case being in part subspirally coiled. The tubes are composed of fine grains of sand, among which are shell-fragments of Radiolaria and Diatomaceae.

Locality. Off the coast of Central America: Sta. 4631 (lat. 6° 26′ N., long. 81° 49′ W.). Depth 774 fms. Bottom of green sand. Two incomplete specimens and several tubes.

This species resembles *P. tenuis* (Théel) in having the margin of the anal funnel crenulate or toothed, though the crenulations are missing anteriorly and the funnel differs conspicuously in form from this and other known species. A characteristic difference is in the presence of capillary setae on the last somite and the partial coalescence of this with the preceding somite. Both the capillary setae and the uncini also present characteristic features.

MALDANELLA McIntosh.

Challenger Annelida, 1885, p. 384.

Anterior end of head not specially set off. Nuchal organs more or less diverging cephalad, or with the anterior ends curving out in hook-like form. Median ridge present as a weak keel, low and flat. Just caudad of the caudal ends of the nuchal organ a pronounced transverse furrow and several finer sulci either extend entirely across plate or form a series on each side. A less pronounced, wide furrow crosses the plate toward the anterior end. Free margin strongly developed all the way around.

Eighth somite double, bearing setae both anteriorly and posteriorly. Posterior segments decreasing in length caudad, the part between the last setigerous segment and the anal cirri proximally subcylindrical and distally widening more or less strongly, funnel-shaped.

Anal cirri all short, subtriangular or tooth-like, equal or nearly so, none on the midventral line.

First setigerous somite bearing only the dorsal capillary setae, all others with neuropodial uncini as well.

Glandular bands present about front border of anterior somites. The setigerous elevations may form glandular tori also, which are more sharply defined and elevated caudad, corresponding glandular tori also occurring on the last three non-setigerous somites.

Neck of uncini more or less bent upwards. Subrostral setae numerous, extending across tip of the large hook. The anterior capillary setae very fine, bilimbate at least in distal region. Posterior or major capillary setae of all somites with slenderly acuminate limbate region and fine, smooth tip.

GENOTYPE. — *M. antarctica* McIntosh.

McIntosh established this genus (Challenger Annelida, 1885, p. 394, 396, 398) for three species, *M. antarctica*, *M. valparaisensis*, and *M. neo-zelandica*. Unfortunately he gave no diagnosis of the genus whatsoever, and designated no type; and the descriptions of the species are too incomplete to furnish the information necessary for a satisfactory diagnosis. But the species described below are undoubtedly congeneric with those described by McIntosh, and on this assumption the diagnosis given above has been drawn up. *Axiothea campanulata* Moore, as indicated by Arwidsson, seems also to conform to this genus.

MALDANELLA FIBRILLATA, sp. nov.

Plate 72, fig. 1–6; Plate 73, fig. 1–2.

The preserved specimens are a rather dilute light brown, appearing darker, greenish black, in parts where the alimentary canal is seen through the body-wall. The anterior borders of the anterior somites may be whitish.

The body in general is cylindrical, but much widest in the anterior region and decreasing caudad to the slender caudal region. Greatest diameter of the largest specimen, 5.5 mm. Composed of nineteen setigerous somites, followed by three non-setigerous ones in addition to the funnel.

Prostomium and peristomium completely fused. Head obliquely truncate anterodorsally, as usual, at an angle of somewhat more than 45°. Typically from somewhat more than twice to somewhat less than twice as long ventrally as dorsally. Head-plate subelliptic or ovate in outline. The raised limbate margin well developed all around excepting the anterior interruption, or notch, in which is embraced the anterior end of the median ridge. Free margin of limbus entire and smooth. Median ridge low, distinct caudad to where the plate is crossed by the transverse depression, or furrow, behind the middle. From the middle caudad on each side a series of three sulci, each of which extends from the middle ectad, or cephaloectad, or these sulci sometimes more or less united across the middle. Nuchal furrows nearly straight or but little curved, subparallel, excepting at the anterior end where each is bent out abruptly laterad, the ends hooked. (Plate 71, fig. 1, 2).

Mouth strictly ventral, surrounded by the usual elevated border, which is crossed by radiating sulci, the elevated border incomplete on the anterior side, where between its free ends it embraces a low, triangular elevation, or prostomial lobe, the apex of which is continuous with the anterior end of the median cephalic keel above. Immediately caudad of and mesally tangent to the buccal ring is a sharply impressed transverse sulcus, which extends upon each side to a shallow longitudinal furrow.

The first somite caudad of the head is typically clearly longer than wide (in about ratio 9:7). The second somite equal in length and breadth. The third clearly wider than long (in ratio 5:7). The fourth often shortest, being but 1.75 mm. long, with a width of 2 mm., though in some the third is shorter than the fourth. From the third or fourth the somites increase in relative length, the seventh somite in the measured specimen being 3 mm. long and 4 mm.

wide, and the eighth as long as wide, the measurement being 4 mm. each way, while all the succeeding somites are longer than wide. The penult somite in the type is 3.5 mm. long and 1.5 mm. wide, not clearly limited from the anal funnel; the antepenult 4 mm. long and 1.7 mm. wide; the next cephalad 4 mm. long and 2.4 mm. wide; the next 4.4 mm. long by 2.5 mm. wide; the preceding one 4.5 mm. long by 2.6 mm. wide; and the next cephalad equal in length and breadth, which is 3 mm., this being the shortest somite in the caudal region, the more anterior ones again increasing in length, the immediately preceding one being in the type 4 mm. long by 3.4 mm. thick. Anterior somites with the anterior edge somewhat thickened and extending cephalad so as to embrace the caudal end of the preceding segment, but none have a true collar. Each of the first seven postcephalic somites bears setae at the anterior end, the eighth bears them at both ends, this being a double segment, while the following somites bear setae only at the posterior end, the setae being at from one third to one fourth the length from the caudal end.

Anal funnel wider than long. Its width is 2.5 mm., being thus much narrower than the widest somites farther forward. It is widely flaring, evenly campanulate, in form from near its middle distad, but somewhat compressed from side to side. The anterior region of the funnel much narrower, only 1.5 mm. thick in the measured specimen. Free margin of the funnel with from twenty-one to forty equal teeth, of which some may be double. No midventral tooth or cirrus. Anus on a finely ribbed cone which usually extends distinctly beyond the margin of the funnel caudad. (Plate **72**, fig. 3).

No setae on the head and only the notopodial capillary setae present on the first somite. On the succeeding setigerous somites there are, in addition to the capillary setae, also the ventral uncini which are numerous and uniseriate, borne on conspicuous tori, as usual. There are mostly near eighteen or twenty uncini in a series on the second somite, thirty to thirty-five on the third. No setae on the three somites preceding the anal funnel. Posterior capillary setae pale yellow, rather long, those of the posterior somites near 2.5 mm. in length. They are nearly smooth, distally tapering to a long and exceedingly fine point, the distal portion more or less curved, on the convex side and extending some distance below the curved part a very narrow and inconspicuous limbus. Each seta with a thin, denser vitreous cortex, the medullary portion traversed by numerous, very fine, and regular fibrillae. The anterior capillary setae arranged in a row inserted at bases of the posterior ones; much shorter and very much more slender than the posterior setae, the diameter of the latter being between four and five times as great as that of the former (nearly as 4.5:1.); ending in an exceedingly fine point the distal region immediately below which, at least in those of most somites, presents series of cilia or pectinae somewhat as in *Isocirrus planiceps.* (Plate **73**, fig. 1, 2). The uncini with exposed portion bent up at neck, the buried portion curved. Exposed part with a distinctly narrowed curved region, or cervix, above a well-marked shoulder. The head of uncini of first segments nearly always with four hooks or teeth, more rarely with but three, of which the largest is typically nearly straight, occasionally curved at tip. (Plate **72**, fig. 4–6). The uncini on the middle and posterior somites similar to those of the anterior excepting for a somewhat stronger development, the number of teeth being four or five instead of three or four, an additional small tooth being added. The minor hooks in uncini of the middle region tend to be carried farther distad, more elevated. The large hook is distinctly fibrillar, and, though the fibrillae are less conspicuous than those of the neck, they may commonly be traced nearly to the apex. The smaller hooks are also fibrillar. The subrostral bristles numerous, attached about, and for a considerable distance proximad of, the subrostral angle, long.

LOCALITIES. Off Panama: Sta. 3361 (Type-locality). Depth 1,471 fms. Bottom of Globigerina ooze. 25 February, 1891. Several broken specimens, of which the type is complete excepting that the anal funnel is separated from the body.

Off Mexico: Sta. 3415 (lat. 14° 46′, long. 98° 40′). Depth 1,879 fms. Bottom of green mud and Globigerina ooze. 10 April, 1891. From this Station the anterior ends of four individuals, with pieces of various other portions, and numerous tubes.

This species is readily distinguished from all others by the different structure of the uncini and capillary setae, as also by the details of the head-plate.

The tubes from Sta. 3361 consist of the usual tough, hyaline, lining membrane, and a wall of soft, loose, greyish mud composed largely of the shells of Radiolaria entire or in fragments, Globigerinae, and the frustules of diatoms, largely of the characteristic marine discoid forms. The mud of the tubes from Sta. 3415 is more compact and is composed on the whole of smaller pieces, there being fewer entire shells and more fine granular fragments. In these, diatom frustules are numerous.

SONATSA, gen. nov.[1]

Head-plate comparatively long. Anterior tip relatively narrow and long. Lateral free borders long, distinctly separated from the caudal division by an incision on each side. Median ridge, or keel, long, extending to the caudal marginal free border, and very high. Nuchal organs short, bowed mesad, anterior end not uncate.

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[1] Gosiute, soma, or in combination, so, many, and natsani, natsa, hook.

Anterior region irregularly pigmented.

Each of the first four setigerous somites divided by an encircling transverse furrow into two annuli, a narrow anterior one and a major posterior one which bears the setae, and which has the anterior lateral border curved cephalad. Between the anterior annulus of the first somite and the mouth a longer annulus more or less clearly indicated by a fine furrow behind the mouth, and extending to the incision between the lateral and caudal portions of the free cephalic border on each side.

No uncini on first setigerous somite. Present on the second, third, and fourth somites in a single series, and relatively few in number. On the fifth somite they are abruptly much more numerous and are arranged in several crowded rows (three in the genotype). On the immediately succeeding somites the uncini mostly in two series, which may be irregular or incomplete. Uncini with a long buried stem and a well-differentiated outer division, with teeth moderately developed and several hairs below the major hook. Capillary setae slenderly acuminate, limbate.

GENOTYPE.— *S. meridionalis*, sp. nov.

This genus seems clearly to be most closely related to Maldane Grube and Asychis Kinberg, of the subfamily Maldaninae. From both of these genera it differs in having the uncini on some of the somites in two or more series. It is much like Maldane in the character of the head-plate, *e.g.*, in the long lateral free borders, the high and long median keel, and the form of the nuchal organs. It differs in apparently lacking the dorsal glandular area on the fifth setigerous somite characteristic of Maldane. The genus is here placed in a distinct subfamily, the Sonatsinae, as shown in the key (p. 409).

SONATSA MERIDIONALIS, sp. nov.[1]

Plate **71**, fig. 1–8.

Greyish brown, the anterior portion with more darkly pigmented areas that appear to have been bleached in preservation.

Body widest cephalad, abruptly narrowing at the sixth segment, which is broader anteriorly than caudally. On the sixth segment a broad glandular ventral band between and in front of the parapodia, a similar but smaller one on the seventh, and also cross-bands on some succeeding somites. On the sixth and succeeding somites the uncini are borne on distinctly elevated glandular tori; and connecting the tori of these somites a narrow, thickened, and transversely wrinkled or folded longitudinal band on each side. In the type the diameter of the first somite is nearly 3 mm.; that of the seventh only 2 mm.

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[1] meridionalis, southern.

The tip of the head is narrow and pointed, much narrower than it is, *e.g.*, in *Maldane sarsi.* Lateral free border high and continuous from anterior end to the caudal limbus, the edge smooth. Caudal limbus with the edge forming at the middle a reentrant angle which is a little greater than 90°. Keel extending as a low ridge on tip of head, transversely depressed near base of latter and then continuing as a conspicuously high ridge to the caudal end of the plate. Nuchal organs narrow and short, bowed mesad. Behind the middle of the cephalic plate along inner base of free border there is a deep furrow on each side which continues about the caudal end. There is a broad but low elevation about the caudal end of mouth, this elevation radially crossed by numerous fine sulci. In front of the mouth two narrow low ridges which meet at an angle at the median line, these being also transversely wrinkled.

The uncini of the second setigerous somite in the type near nine on each side; those of the third and fourth, fifteen to eighteen; of the fifth, one hundred or more; and those of the sixth about forty-five or fifty. The uncini of the anterior somites are conspicuously narrowed at the neck, producing a distinct shoulder, the exposed portion having an even or nearly even curve with the rest of the seta. Head bearing two teeth or hooks, or sometimes a weak third one present, a large straight one and a smaller one back of this, and also bearing across the free end transversely a series of slender, closely appressed teeth, or spines, which extend over and partially ensheath the base of the larger hook. Subrostral hairs arising from a moderately salient angle close to base of the larger tooth. Hooks fibrous. The fully developed uncini of more posterior somites are larger and have the crown broader, with three and sometimes four hooks, and the subrostral hairs six or more in number. The posterior or major capillary setae with a long, slender, acute tip, which on the most anterior segments appears smooth, but on the others bears numerous fine and closely arranged teeth; on the gradually widening part below the tip there is on one side a very narrow limbus, the limbus of the other side being obsolete. Anterior, or minor, capillary setae much finer and shorter than the posteriors, as usual.

Caudal end of type missing.

Locality. Between Galapagos Islands and Peru: Sta. 4651 (lat. 5° 42′ S., long. 83° W.). Depth 2,222 fms. Bottom of sticky grey mud. 11 November, 1904. One incomplete specimen.

Gen. et sp.?

Some tubes and a posterior fragment of a single specimen which cannot with entire certainty be referred to any genus known to me. Behind the setigerous somites there is a more slender non-setigerous portion narrowing caudad and consisting of six somites. The more posterior of these are strongly transversely wrinkled. Between this region and the anal cirri is a smooth ring which narrows at the caudal end and there bears a circle of cirri; at its caudal end it is weakly longitudinally furrowed for a short distance. The cirri are subequal, short, crowded, and twenty-six in number. The diameter of the circle of cirri is clearly less than that of the anterior end of the smooth ring. Within the circle of anal cirri a conspicuous, anal, cylindroconical body projects straight caudad and bears the anus in a strictly terminal position. The cone is strongly radially folded, with the midventral fold largest.

Locality. Off Mexico: Sta. 3415 (lat. 14° 46′ N., long. 98° 40′ W.). Depth 1,879 fms. Bottom of green mud and Globigerina ooze. Bottom temp. 36° F. 10 April, 1891. One fragment, with tubes.

Ammocharidae.

Closely related to the Maldanidae is the Ammocharidae, which is not represented in the Albatross collections. It is sometimes known as the Oweniidae; but as the genus Owenia Delle Chiaji is preoccupied, its place must be taken by Ammochares Grube and the name Ammocharidae accordingly given precedence. A second genus is Myriochele Malmgren, which differs from Ammochares, *e.g.*, in having no branchiae in the anterior region and the mouth more ventral in position.

Terebellidae.

The members of this large and complex family have a general resemblance to the ampharetids, of which they are apparently the nearest relatives. They may be of very large size, the length sometimes being thirty or forty centimeters. The body, as in the ampharetids, presents an anterior broader region, or thorax, on which biramous parapodia are borne, and a narrower abdominal region bearing only the neuropodia or uncinigerous tori, or rarely also bearing capillary setae (Aphlebina). The thorax, however, is less differentiated than in the Ampharetidae. The colors are often bright and variegated.

The prostomium bears filamentous tentacles that are more or less long and numerous and that arise from a lobe or lobes of varied form and size. No tentacular cirri.

Branchiae may be either present or absent. When present there may be one, two or three pairs, and these may be of the cirriform, subulate, arborescent or pectinate type.

The notopodial thoracic setae are capillary and generally limbate, with the border sometimes in part denticulate or serrulate. The crochets may be of varied form, avicular, pectiniform, rostrate or acicular, with either all of one kind or with one kind anteriorly and another posteriorly. Rarely no setae at all occur (Hanchiella).

The alimentary canal shows a division into pharynx, oesophagus, stomach, and intestine. But unlike the stomach of the ampharetids, that of the members of this family shows a division into a chitinous stomach and a glandular stomach, with no trace of anterior or internal caeca.

The terebellids are normally tubicolous, though some adults may at times leave their tubes and swim freely through the water, as noted by Michaelsen (Jahrb. Hamb. wiss. anstal., 1892, **9**, p. 110) in the case of *Nicolea venustula* Montagu. Free swimming young forms have more often been noted; and St. Joseph has recorded (Ann. sci. nat. Zool., 1899, ser. 5, **10**, p. 185, pl. 6, fig. 20–24) a highly interesting case of pregenesis in a free-swimming postlarval stage of his *Amphitrite praecox*. This young form has long setae of the general type of the natatory setae of the epitokous stages of various other annelids, and at the same time bears eggs. As pointed out by Gravier (Nouv. arch. Mus. hist. nat., 1908, ser. 4, **10**, p. 211) this case of pregenesis, apparently complicated by epitoky, is intermediate as to date of appearance between the pregenesis noted in ciliated larvae of Paractius, Ophryotrocha, and Wartelia and the normal case.

The tubes of the terebellids consist of a lining membrane, secreted by the animal, to which become consolidated mud, sand, spicules of sponges, fragments of shells, or other material from the surroundings. The tubes are large in proportion to the size of the contained animals. The tubes ordinarily occur in mud, or sand more or less mixed with mud, though some are found in solid calcareous masses, which it has been suggested they penetrate by means of an acid secretion. Such a form is *Terebella lapidaria* Linné. Other species attach their tubes to shells, rocks, corals, etc.; and Gravier (*Op. cit.*, p. 211) mentions having found numerous examples of *Noimia medusa* Savigny and one of *Thelepus thoracicus* Grube in the canals of *Hircinia echinata* Keller. The mouths of the tubes may be surrounded by long filamentous processes, or spines (Dinard, Ann. sci. nat., 1894, **17**, p. 185).

Most known terebellids occur in the littoral zone, or at moderate depths, though some descend to great depths, *e.g.*, *Terebellides eurystethus*, sp nov. (p. 438) which was secured off Peru from 2,600 fms. *Eupistella* (*Eupista*) *darwini* was dredged by the CHALLENGER from 2,750 fms.

Parasites are frequent upon or in the terebellids.[1] St. Joseph notes the common occurrence of protozoan parasites such as Cothurnia, *Rhabdostyla sertularium* Savigny, and *Ophryodendron annulatorum*. The crustacean *Terebellicola reptans* Sars was found originally attached to a large terebellid. *Crypsidomus terebellae* was found by Levinsen in the intestine of *Amphitrite cirrata*. Distomes often occur encysted in the anterior somites of terebellids. Southern mentions the frequent occurrence of *Polynoe scolopendrina* in the tubes of *Thelepus setosus* (Quatrefages), a species occurring on the Irish coast commonly under stones, in Laminaria roots, and in Zostera beds.

Key to the Subfamilies and Genera.

a. Ventral plates developed.
b. Peristomium prolonged into a long papillose proboscis; uncini of thorax rostrate or crochet-formed, those of abdomen avicular . . . . *Artacaminae.*
Filiform branchiae numerous, arising in fasciae on third, fourth, and fifth somites. *Artacama* Malmgren.
bb. Peristomium not prolonged into a papillose proboscis.
c. Prostomium short, with numerous tentacular filaments . . . . *Terebellinae.*
d. Uncini pectiniform, not having transverse rows of denticles. Setae beginning on fourth somite, occurring on seventeen somites, tips entire; uncini with 4–6 teeth, in a double series on part of somites; three pairs of arborescent branchiae . . . . *Loimia* Malmgren.
dd. Uncini avicular, with transverse series of teeth at vertex.
e. With no branchiae.
f. Uncini with base long, the vertex relatively low, with 3–6 crenuli, 4–5 denticles in each series.
g. Capillary setae beginning on fourth somite; setigerous somites few.
h. Setae all with tips similar.
i. Capillary setae with tips smooth; anterior and posterior nephridia subsimilar. *Leaena* Malmgren.
ii. Setae with tips dentulate; anterior nephridia decidedly larger than the posterior. *Lanassa* Malmgren.
hh. Setae in part with tips entire and in part with tips dentulate . . . . *Phisidia* St. Joseph.

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[1] *Cf.* McIntosh, Ann. mag. nat. hist., 1894, ser. 4, **13**, p. 9, etc.; Watson, Journ. Royal micr. soc., 1890, p. 685, pl. 14, f. 1–8.

gg. Setae beginning on third somite; setigerous somites numerous.
Setae laminate, with tips entire, some straight and some geniculate. *Laphania* Malmgren.

ff. Uncini relatively short at base, with the vertex elevated and showing a larger number of crenulations (7–11); teeth in series typically fewer.

g. Uncini with posterior prolongation.
Setae all with tips entire, beginning on fourth somite; few somites setigerous. *Pherea* St. Joseph.

gg. Uncini without posterior prolongation.

h. Setae all with tips entire, beginning on fourth somite..........*Bathya* St. Joseph.

hh. Setae in part with tips entire, others with tips dentulate, beginning on third somite. *Proclea* St. Joseph.

ee. Branchiae present.

f. Capillary setae beginning on the fourth distinct somite.

g. Setae with apex dentulate.

h. Trunk of branchiae reduced, the branches simple filaments. (Posterior nephridia on each side connected)..........................*Amphitrite* O. F. Müller.

hh. Trunk of branchiae well developed, the branches subdivided or branched.

i. All nephridia free from each other....................*Neoamphitrite* Hessle.

ii. Posterior nephridia on each side united together by a longitudinal canal. *Terebella* Linné.

gg. Setae with apex entire.

h. Uncini of some of anterior somites having a long prolongation or manubrium from posterior side of base.

i. With two pairs of subulate branchiae like those typical in the Ampharetidae. *Eupistella*, nom. nov.

ii. With from one to three pairs of ramose branchiae.

j. Nephridia all free from each other......................*Pista* Malmgren.

jj. Posterior nephridia on each side united by a longitudinal canal (uncini of double rows interlocking)............................*Lanicides* Hessle.

hh. Uncini squat, base of medium length, without such posterior prolongation.

i. Vertex with two crenuli and two transverse series of denticles at vertex.

j. With two pairs of ramose branchiae.
Uncini squat, two rows of 3–5 teeth, in a single row, or rarely in a double interlocking series on certain somites....................*Nicolea* Malmgren.

jj. With three pairs of ramose branchiae; uncini with two series of but 1–3 teeth.

k. Uncini of elevated form, with no lateral salient or fixing ligament, fixed alone by the muscle at the anterior inferior angle of the base; two rows of opposing uncini on a number of the somites..........*Lanice* Malmgren.

kk. Uncini squat, with a small lateral salient and fixing ligament; two rows of interlocking uncini (or rarely single rows alternating)..*Eupolymnia* Verrill.

ii. Vertex of uncini with three or more crenuli and three series of denticles.

j. Thoracic uncini with three crenuli at vertex.
First four somites with no lateral foliaceous lobes; a single pair of branchiae. *Euscione*, nom. nov.

jj. Thoracic uncini with four or five crenuli at vertex.

k. First four somites with lateral foliaceous lobes, the last pair united across dorsum; one pair of branchiae; five series of denticles....*Scionella* Moore.

kk. First four somites with no such lateral foliaceous lobes; three pairs of branchiae; four series of denticles..............*Scionides*, gen. nov.[1]

ff. Capillary setae beginning on the second or third distinct somite (all with apex entire excepting in Neoleprea).

g. Setae beginning on the second somite and occurring on a large number of somites.

h. Branchiae arborescent (three pairs, in type on somites II, III, and VI). *Polymniella* Verrill.

hh. Branchiae cirriform or subulate.

i. With four clusters of cirriform branchiae..................*Eugrymaea* Verrill.

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[1] GENOTYPE, *Terebella reticulata* Ehlers.

ii. With less than four pairs or groups of branchiae.

j. Branchiae subulate as in typical ampharetids, three pairs. *Euthelepus* McIntosh.

jj. Branchiae cirriform.

k. A single pair of branchiae.......................... *Protothelepus* Verrill.

kk. Three pairs of branchiae.......................... *Streblosoma* Sars.

gg. Setae beginning on the third somite.

h. First three somites with large lateral foliaceous lobes, on the last forming a lobe across dorsum (uncini with but single crenulus and single series of denticles at vertex).

i. Branchiae arborescent, a single large pair............... *Thelepella,* gen. nov.[1]

ii. Branchiae each consisting of 3 or 4 filaments united at base, three pairs. *Thelepides* Gravier.

hh. First somites with no such lateral foliaceous lobes.

i. Uncini beginning on the fourth somite; branchiae branched.. *Naneva* Chamberlin.

ii. Uncini beginning caudad of the fourth somite; branchiae simple.

j. Uncini beginning on the fifth somite.

k. Uncini in part in double series; capillary setae with apex dentulate. *Neolepea* Hessle.

kk. Uncini in all cases in single series; capillary setae with apex entire. *Thelepus* Leuckart.

jj. Uncini beginning on the eleventh somite.
Capillary setae on only fifteen somites.............. *Parathelpus* Caullery.

cc. Prostomium forming a large upper lip giving rise to numerous tentacles (branchiae none or a single quadripartite pectinate one).
Uncini of thorax rostrate, of abdomen avicular or else absent from thorax or from entire body (branchiae none)... *Polycirrinae.*

d. Uncini none.

f. Notopodial setae present (six pairs of fasciae)................... *Lysilla* Malmgren.

ff. No setae at all present.. *Hauchiella* Levinsen.

dd. Unctni present.

e. Notopodial capillary setae present to posterior end of body........ *Aphlebina* Quatrefages.

ce. Capillary setae limited to anterior region of body.
Neuropodia absent from thorax.

f. Neuropodial setae needle-like................................. *Amaea* Malmgren.

ff. Neuropodial setae unciniform................................. *Polycirrus* Grube.[2]

aa. No ventral plates developed.................................. (*Trichobranchidae* of Hessle).

b. With two or three pairs of filiform branchiae; uncini of thorax rostrate, of abdomen avicular. *Trichobranchinae.*

c. With three pairs of discrete branchiae which lack an upper folded part; no chitinous stomach. *Trichobranchus* Malmgren.

cc. With two pairs of discrete branchiae, with an upper, more or less folded, part; a chitinous stomach.................................... *Octobranchus* Marion and Bobretzky.

bb. Branchiae grown together into one or two bodies or absent; uncini of thorax rostrate, of abdomen pectiniform.. *Terebellidinae.*

c. Branchiae none.. *Aponobranchus* Gravier.

cc. Branchiae present.

d. Branchiae united into two groups or bodies........................ *Ampharetides* Ehlers.

dd. Branchiae united into one body.................................. *Terebellides* Sars.

The classification outlined in the key is based primarily upon that proposed by Malmgren in 1865 (Öfvers. K. vet. akad. Förh., 1865, p. 372 *et seq.*) the five subfamilies being those defined by that worker under the names Amphitritea,

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[1] GENOTYPE, *Terebella cetrata* Ehlers.

[2] *Cf.* Zool. bidrag från Uppsala, 1917, **5**, p. 66, 129, etc.

Polycirridea, Artacamacea, Trichobranchidea, and Canephoridea. The endings of these are changed to the standard form for subfamilies, and Canephoridea is replaced by Terebellidinae to agree with an included genus and Amphitritea by Terebellinae.

Christian Hessle (*Op. cit.* 1917) unites the Artacaminae with the Terebellinae (Amphitritinae) and erects a subfamily Thelepinae for Thelepus and some related genera, this being characterized by having the uncini throughout in single rows as in the Polycirrinae, the nuchal organ developed, the tentacle-bearing region not widened, and the branchiae consisting of simple filaments arranged in cross-rows. In separating genera Malmgren placed too great reliance upon the number of setigerous fasciae, these being in the main too variable for generic differentiation by themselves, as shown by Marenzeller (Sitzungsb. K. akad. wissensch. Wien, 1884, **89**, p. 152–214) and St. Joseph (Ann. sci. nat. 1894, ser. 5, **17**, p. 166). As to the branchiae, great care must be taken in relying upon them, since the number may vary with age in one and the same species of certain genera (*e.g.*, Amphitrite). Much importance is to be attached to the structure of the setae, and particularly the detailed structure and arrangement of the uncini. But even upon the basis of these characters the separation of the genera may be a matter of difficulty and delicacy since certain variations may likewise occur in the uncini with change in age, as noted for instance in *Loimia medusa* Savigny by Gravier (Nouv. arch. Mus. hist. nat., 1908, ser. 4, **10**, p. 224, text fig. 396–399).

Synonymy of Genera.

Laphaniella Malmgren is apparently to be included in Leaena Malmgren.

Scionopsis Verrill is synonymous with Pista Malmgren.

Idalia Quatrefages and Axionice Malmgren are also here included in Pista Malmgren.

Grymaea Malmgren and Streblosoma Sars are synonyms. Grymaea has the priority but is preoccupied, and so Streblosoma must be used.

Physelia or, as also written, Phyzelia, Quatrefages included species of Amphitrite, Pista, and Nicolea.

Scione Malmgren (1865) is preoccupied by Scione Walker (Dipt., 1856). Hence it is here replaced by Euscione, nom. nov.

Thelepides Southern (1914) is preoccupied by Thelepides Gravier (1911). It is replaced by Parathelepus Caullery (1915).

Eupista McIntosh is preoccupied by Eupista Hübner (1816). It is here replaced by Eupistella, nom. nov.

Terebella Linné.

Syst. nat. ed. 12, 1767, **1**, p. 1092; St Joseph, Ann. sci. nat., 1894, ser. 5, **17**, p. 181, 202.
Leprea Malmgren Öfvers. K. vet. akad. Förh. 1865, **22**, p. 389; Marenzeller Sitzungsb. K. akad. sensch. Wien, 1884, **89**, p. 179.
Heteroterebella Quatrefages, Hist nat. annelés, 1865, **2** p. 384.
Heterophyselia Quatrefages, *Ibid.*, p. 386.
?Schmardanella McIntosh, Challenger Annelida, 1885, p. 449.

Terebella panamena, sp. nov.

Plate **79**, fig. 7, 8.

General color throughout light yellow, the dark contents of the alimentary canal showing through the walls in the caudal half.

The body narrows very slightly caudad excepting at the extreme end, which is narrowed subconically to a narrowly rounded point. Thorax not set off from abdomen by difference in width. The greatest width of the thorax is in the type 2.2 mm., the middle region of the abdomen being but little narrower, about 2 mm. The total length, exclusive of the tentacles, is 30 mm. Length of the tentacles about 8 mm. The total number of somites is close to ninety-two.

The tentacles are numerous, proportionately moderately coarse, and channeled longitudinally in the usual way.

The peristomium is a complete ring which is especially large laterally and ventrally. The ventral lobe is transversely elongate, clearly wider than the ventral plates excepting that of the second somite, with the anterior edge straight and the ends convex. It is much longer than the ventral plates and is bowed ventrad.

There is neither ventral nor lateral flap on the third somite. The second somite presents a ventral plate as wide as the lip-lobe of the peristomium, with its anterior margin convex. It is decidedly wider and longer than the ventral plate of the third somite, the anterior and lateral edges of which are straight. The first two ventral plates together flare ventrad below the level of the other plates.

There are two pairs of branchiae, which are dwarfed and have comparatively few branches.

The precise number of setigerous somites cannot be determined, but seems to be at least twenty-eight. The setae begin on the fourth somite, the uncini on the fifth.

There are only fourteen ventral plates, these beginning on the second body-somite, as above indicated. The third ventral plate in the type is much shorter than either the second or the fourth. The plates from the second to the ninth are of nearly uniform width and length, the remaining ones decreasing gradually caudad.

The setae are nearly straight proximad of the especially prominent fringed tip. The distal portion is gradually but moderately narrowed, and has a very narrow limbus on each side. The apical portion bends out at a conspicuous angle with the stalk and is drawn out into a long, slender, bristle-like tip. It is proximally fringed along its upper edge. The shaft has the usual finely fibrillar structure. (Plate **79**, fig. 7).

The uncini are uniseriate on somites anterior to the eleventh somite. On the eleventh and succeeding thoracic somites they are in two opposed series. The base of an uncinus is short, with the dorsal edge strongly convex, its process being obtusely angular, or somewhat rounded, and rather conspicuous. The subrostral process is situated well toward the toe of the plate. The main hook, or beak, is stout, long, and acute, and in the usual strongly uncate position. The sinus beneath it has the sides moderately divergent. The prominent crest above the beak bears numerous teeth arranged in three or four transverse series. (Plate **79**, fig. 8).

The anus is bordered by a moderately elevated rim which is transversely ridged.

LOCALITY. Panama: Perico Island. Shore. 26 October, 1904. One specimen.

In the form of the setae this species much resembles *T. pacifica* Moore, known from off the coast of San Diego, Cal., and northward; but in the structure of the uncini it is clearly different.

NICOLEA Malmgren.

Öfvers. K. vet. akad. Förh., 1865, **22**, p. 380; ST. JOSEPH, Ann. sci. nat., 1894, ser. 5, **17**, p. 182.

NICOLEA TABOGUILLAE, sp. nov.

Plate **79**, fig. 12, 13.

The present species evidently lies in a group with *N. bilobata.* The typical specimens are smaller than *galapagensis* and larger than *bilobata.* The type, exclusive of the tentacles, has a length of near 55 mm., with a maximum width of 3.9 or 4 mm., which is at the twelfth somite. From there the body narrows cephalad and more decidedly caudad, the thorax passing gradually into the abdomen, which at its beginning has a diameter of 2 mm. and narrows gradually from near its middle to the more abruptly narrowed caudal tip. The widest level in the thorax is farther caudad than in *galapagensis* with the narrowing cephalad more gradual. The type consists of about one hundred and twenty-eight somites.

The prostomium bears numerous tentacles above and laterally which are proportionately shorter and somewhat finer than in *galapagensis*. The tentacles are transversely banded with numerous fine brown lines, these in the paratype less marked than in the type.

The peristomium forms a prominent lower lip, of which the distal edge is straight.

On each side a lateral membranous fold arises on the third somite as in related forms; line of attachment straight, not crossing to the second somite as it does in *galapagensis*, etc. The fold is transversely elongate and is abruptly shorter from the middle to the mesal end. It is crossed longitudinally by many fine white veins or lines. (Plate 79, fig. 12).

The branchiae are smaller than in *galapagensis*. The filaments are similarly numerous.

There are seventeen setigerous somites.

The ventral plates are sixteen or seventeen in number. Together they form a narrow area which narrows acutely caudad. The plates are relatively very narrow, the plate of the twelfth somite being only 1 to 1.2 mm. wide, while the total width of this somite is 4 mm. In *galapagensis* the ventral plates are relatively decidedly wider, the plate of the twelfth somite being 2.7 mm. wide in a specimen in which that somite has a total width of 5.2 mm.

The thoracic uncini are uniseriate on somites V to VII inclusive. On the others they are in two interlocking series, in one of which they are progressive and in the other regressive.

The uncini are decidedly smaller than in *galapagensis*, the prominence on the convex edge is clearly less pronounced, and the prominence on the opposite edge is relatively farther from the base of the large tooth. The small teeth above the base of the large one are arranged very clearly in two rows, the median tooth of the first of these series being large. (Plate 79, fig. 13).

The caudal tip of the abdomen is strongly narrowed, the tip as seen from above running to a subacute point. The anus is vertically somewhat elongate and is bordered by a series of small rounded folds or tubercles.

Locality. Panama: Taboguilla Island. Shore. 31 October, 1904. Two specimens.

Nicolea galapagensis, sp. nov.

Plate 80, fig. 1–3.

The general color at present is light brown, in some of a weak greenish tinge. The tentacles are more yellowish and the branchiae still paler.

The body is broadest toward the anterior end of the thorax, where it is also thickest dorsoventrally. From there the body narrows conspicuously, the abdominal region being long and slender. The body is in each part nearly cylindrical, the dorsum being strongly convex and the venter more weakly so. The width at the anterior end in one specimen is 6.5 mm., and the depth the same, or slightly greater. The width in the abdominal region, excepting the extreme anterior and posterior ends, is mostly from 2.7 to 3 mm. The total length cannot be ascertained, as the caudal part is broken off. Another specimen, which is complete and has a maximum width of thorax of 4.2 mm., has a total length, exclusive of the tentacles, of near 70 mm. The tentacles, fully extended, measure about 25 mm. in length. This specimen consists of ninety-three somites.

The prostomium forms a prominent upper lip which protrudes over and at the sides of the mouth in the form of a hollow half cylinder. Back of this part is a narrow transverse fold, or ridge, which is conspicuously crenulate along its anterior edge and bears along this edge the moderately numerous long tentacles. The tentacles are slender and of only moderate length. They present the usual longitudinal furrow along one side.

The peristomium presents below a prominent median lobe in the form of a conspicuous lower lip, the cephalic edge of which is mesally concave, with the margin each side of the concavity slanting obliquely ectocaudad.

On each side of the third segment arises a large, foliaceous, membranous flap, which extends obliquely across to end on the second segment. Each of these lobes is transversely ovate in outline, with the narrow end mesad. The lobe is crossed by numerous white lines, which bifurcate cephalad as in *bilobata.* (Plate 80, fig. 2). There is no median fold from the third segment extending forwards over the second such as described by Augener for Australian specimens of *bilobata,* the separation of these segments ventrally being clear, though the second is reduced.

Of the two pairs of branchiae, the caudal are the smaller and are more ectal in position. Each branchia has a stout trunk which bifurcates almost immediately, each branch then bearing several tertiary branches which in turn bear the ultimate filaments directly or, in part, after still farther branching. There is a papilla back of the base of each branchia.

Nearly always there is a large segmental papilla between the notopodia of the sixth and seventh, and of the seventh and eighth somites, while one may also sometimes be detected on a preceding somite. In one specimen segmental papillae are evident between the processes throughout the thoracic region from the sixth segment caudad.

There are the usual seventeen setigerous somites. The ventral plates number sixteen or seventeen. The anterior ones are very short, the succeeding ones decreasing in breadth and increasing in length until the last ones are quadrangular or trapeziform, with the length fully equalling the width. The decrease in width in going caudad is very gradual.

The setae are finely pointed. Along the distal part is a narrow wing, the edge of which is more or less uneven. The thoracic uncini from the fourth to the seventh somite, inclusive, are arranged in a single series. On the others they are in two completely interlocking series. On the abdomen they are in the usual single series. The abdominal tori are short, but rather high. They are almost equally prominent over most of the length of the abdomen, but toward the caudal end become lower. The uncini above the principal fang have ordinarily but one distinct series of teeth, these numbering usually six, of which the middle ones are distinctly longest and stoutest, the two adjoining ones most commonly of intermediate size but sometimes as large as the middle ones. Occasionally a tooth near the middle of the series is crowded back and reduced in size, and then appears at a distinct level on the apex. The crowding of the teeth may make the series uneven; but there seem never to be truly two series such as occur in *bilobata* Grube. In profile each uncinus presents on the convex side near its middle a conspicuous, angular protrusion. (Plate 80, fig. 1).

The caudal end of the body, including about the last eight somites, is abruptly narrowed, the narrowed region decreasing in width gradually caudad and being truncate at the end. The border of the anus is radially folded. (Plate 80, fig. 1).

LOCALITY. Galapagos Islands: Chatham Island. 8 January, 1905. Seven specimens.

There must, for the present, remain a little doubt about the precise identity of Grube's *bilobata*. I have accepted it as described by Augener. The present species seems to differ clearly from the Australian form described by that author in having the superior teeth of the uncini in but a single series instead of in two, in wholly lacking any ventral fold on the third somite, as well as in the much larger size. *N. bilobata* is evidently subject to considerable variation in many of its characters; and only the examination of extensive material from various localities will make it possible to determine its actual limits.

NICOLEA PROFUNDI, sp. nov.[1]

Plate **79**, fig. 9.

The general color of the body is carneous. The setae are pale yellow.

The body has the general form of *N. taboguillae*, sp. nov., but with the abdomen proportionately broader and the caudal portion of the thorax more slender. The type has a maximum width of 4.2 mm., exclusive of the parapodia, with the abdomen in the middle region 3 mm. wide. The length of the type to the end of the thoracic region is 21 mm., and the total length near 48 mm. The total number of somites is forty-eight to fifty, being thus much less than in the two preceding forms.

The prostomium is decidedly shorter than in *N. galapagensis*. It is bent around the mouth above and laterally. It has a transverse furrow above, in which the tentacles are inserted. Behind this furrow is a conspicuous transverse fold, or ridge, on which no eye-spots are detectable. The tentacles are few and form scarcely more than a single, uneven, transverse series. They seem to be short, but are mostly missing from the types.

The ventral lobe, or lip, formed by the peristomium, is proportionately broader than in either of the preceding species, and is narrower proximally than distally instead of widening proximad. The distal edge is nearly straight, with the lateral corners rounded.

The second somite is longest laterally. The third somite has neither lateral nor ventral flap or fold.

No segmental papillae are evident.

The branchiae are missing from the types.

There are seventeen setigerous somites, the setae beginning on the fourth and the uncini on the fifth somites, as usual.

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[1] profundum, depth of the sea.

The ventral plates increase in length and decrease in width in going caudad, as usual. Taken together they form a narrow band, the caudal end of which is acutely narrowed. There are ten well-developed plates. In the paratype there is but one definite plate caudad of these, but in the type there are four or five reduced ones which are not contiguous and are abruptly narrower.

The notopodial setae are long, with the tips very slender; the two wings are extremely narrow. The uncini have the usual general arrangement. They are in a single series on somites five to eleven, inclusive, and in two closely interlocking series on the remaining thoracic somites. On the abdomen the series are again single. The uncini are of about the same size as in *taboguillae*, or a little smaller. Above the main fang are numerous, slender, smaller ones arranged in three more or less uneven series. On the convex side the plate abruptly widens to form a conspicuous angular shoulder. On the opposite side the plate is characteristically excavated adjacent to the inferior process. (Plate **79**, fig. 9).

The caudal end of the abdomen is simply rounded, not at all abruptly narrowed or conically pointed. The anus is circular; its narrow, slightly elevated border is radially furrowed, producing a series of contiguous, short, ridges, or tubercles.

Locality. Off Aguja Point, Peru, 20 m. N. W.: Sta. 4654 (lat. 5° 46′ S., long. 81° 31′ 9″ W.). Depth 1,036 fms. 12 November, 1904. Two specimens.

Nicolea latens, sp. nov.[1]

Plate **79**, fig. 10, 11.

General color greyish yellow, with the first few somites above of a somewhat reddish brown color. Setae colorless.

The type has most of the abdomen broken off. The length to the end of the thoracic region is 18 mm. The greatest width is 4 mm. The greatest width is attained at the eighth somite, from where the body narrows gradually both cephalad and caudad. This is also the region at which the body is deepest.

The prostomium presents above the mouth a wide, short and thin membranous fold weakly convexly arching between its ends. Its free margin is weakly crenulate. Caudad of and parallel with this is the conspicuous, thick, tentacular ridge, the anterior slope of which is crenulate in outline from many subvertical furrows, which do not extend across the dorsal surface or ridge.

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[1] latere, to hide.

The tentacles are all lost, only the slender basal region of a few being present.

The mouth-opening is large and triangular in outline, with the base ventrad. It is bordered by a thick rim which is crossed by numerous deep radial sulci. The peristomium presents below a moderately large lower lip, which is transversely elongate and has the anterior margin in general convex, but mesally widely truncate. It is slightly concavely depressed caudad of the anterior border and between the end regions, the depressed region having a length about one half that of the lip as a whole. The depressed area is crossed by numerous longitudinal sulci.

The metastomial somites are convex above and flattened beneath, as usual, with a broad neural depression along the middle in which the intersegmental furrows are deeper and wider than elsewhere. All metastomial thoracic somites are clearly separated by deep furrows ventrally, but only the first five are clearly separated above, the separation between succeeding ones being weak. The first two metastomial somites bulge more convexly ventrally than the others and do not show a neural depression. The first is a little shorter in the midventral region than the labium and shortens conspicuously toward each side; laterally its ventral surface is nearly smooth, but mesally it is crossed longitudinally by a number of deep, closely arranged sulci. Dorsally it is longer than laterally, but shorter than ventrally. The second somite is of nearly uniform length, this being about equal to the median length of the preceding one, the dorsal length being a little greater than the ventral. The midventral region is crossed longitudinally by fewer and weaker sulci. On each side, the anterior border is produced forward in a thin lobe which is longest at the dorsal end, where the dorsal edge is straight, and shortens continuously ventrad and gradually disappears. The free margin of this lobe is crenulate, the crenuli small. The third metastomial somite is ventrally only about one third as long as the preceding one and widens up the side to the dorsum, the dorsal length being more than twice the ventral. Caudad of the middle above there is a weak transverse sulcus. At the side the anterior border is produced forward somewhat as in the preceding somite, but the thin extended region is shorter. The fourth metastomial somite is, in the midventral region, but little longer than the preceding one. It widens toward and up the sides to the dorsum, where its length is shorter than that of the preceding one. The fifth is ventrally nearly twice as long as the preceding one and is also clearly longer above. The succeeding thoracic somites are more uniform, very gradually increasing in length caudad. Branchiae in the type lost; as shown by the basal elevations and scars, there are two pairs, one each on the second and third somite. Those of the first pair are closer together than those of the second.

The first notopodia, occurring on the fourth somite, are but slight prominences. Caudad the notopodia increase gradually in length. In the mid-thoracic region they are short, proportionately stout, cylindrical processes of nearly uniform thickness throughout, and with the distal end truncate a little obliquely.

On the sixth and seventh somites there is on the dorsal surface just caudomesad of each notopodium a pit-like depression in which there is a short process or tubercle.

The notopodial setae begin on the fourth somite, the uncini on the fifth. So far as observed, the uncini were in single series, both anteriorly and caudally, though there is some chance that in the intermediate somites some double series may occur. In the uncini the convex edge has a pronounced, suberect, angular shoulder, about one third the length from caudal end, with a slight tubercle on the free edge close to the angle of the shoulder. At the anterior end the plate narrows to a slender, acute process. On the free edge there is a small, subacute process between the base of the large fang and the acute end of the plate, the process nearer the fang than the end. The principal tooth bends back nearly parallel with the free edge and ends in a very acute tip near the level of the process or ligament attachment. Above the main tooth are two transverse series of smaller teeth, of which the teeth after the terminal series are exceedingly small, or obsolete, and closely appressed in the interval between the others, so often detected only with difficulty. Opposite the shoulder the body of the plate is fibrillate, the fibrillae few, but strongly marked, and extending crosswise, as usual, and into the teeth. In the principal series the teeth are, moreover, apparently commonly from 7–9 in number. (Plate **79**, fig. 11). The notopodial setae are of the usual structure, curved distally, with finely acute tips, distinctly bilimbate, and shafts strongly fibrillate. (Plate **79**, fig. 10).

LOCALITY. Gulf of California: Sta. 3435 (lat. 26° 48′ N., long. 110° 45′ 20″ W.). Depth 859 fms. Bottom of brown mud with black specks. Bottom temp. 37.3° F. 22 April, 1891. One specimen.

EUPOLYMNIA Verrill.

Trans. Conn. acad. sci., 1900, **10**, p. 660.

Polymnia MALMGREN, Annulata Polychaeta, 1867, p. 108; MARENZELLER, Sitzungsb. K. akad. wissensch. Wien, 1884, **89**, p. 199. (*nom preoc.*)

Eupolymnia regnans, sp. nov.[1]

Plate 79, fig. 1–3.

The color is a nearly uniform greyish yellow throughout.

The general form is cylindrical, but with the venter more or less flattened. One specimen, exclusive of its tentacles, has a total length of about 230 mm. and a maximum width across the thorax, exclusive of the parapodia, of 11 mm., this being at its caudal end, the thorax considerably narrower in the branchial region. Abdomen narrowing caudad to a width of about 4.5 mm., a little in front of the caudal end. When extended the tentacles are at least 75 mm. in length. Total number of somites one hundred and thirty, of which one hundred and ten belong to the abdomen.

The prostomium forms an upper lip, from the caudal portion of which, above and extending to the ventral surface, arise the very numerous long tentacles. Back of the tentacles is an elevated region, or transverse fold, on which are numerous minute eye-spots. The tentacles are relatively slender. Each is marked with the usual longitudinal ciliated groove.

The peristomium presents on the ventral side just caudad of the mouth a curved transverse piece, or collar, of which the convexity is cephalad.

The second, third, and fourth somites bear each a pair of arborescent branchiae. Each branchia has a stout trunk, from which arises a large branch which often nearly equals the main trunk in size, thus giving to the branchia the appearance of being bifurcate. Each of the two principal branches bears a number of smaller branches subdividing into filaments that form very dense heads and together have an appearance not unlike that of a head of cauliflower. The branchiae decrease in size from the anterior pair caudad.

Segmental papillae are present on the sides of somites III, IV, V, VI, VII, and VIII, those of the last three being more weakly developed than the others.

Setae begin on the fourth somite and uncini on the fifth.

The ventral plates are eighteen in number. Of these, the anterior are short anteroposteriorly and transversely elongate, the succeeding ones regularly decreasing in width and filling the space between the ventral ends of the uncinigerous tori, and at the same time increasing in length, the outline formed by the plates together being narrowly triangular, with apex caudad. A transverse furrow divides each plate into a narrow anterior portion and a broader posterior one. The latter is subdivided into a number of small areas by longitudinal furrows which do not reach the caudal margin. Of these areas the median one is most sharply defined.

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[1] regnare, to rule or reign.

The notopodia of the seventeen setigerous somites are cylindroconical, with the tips rounded. The setae are borne in a series across the tip and the distal portion of the ventral surface. The setae are all slender and essentially capillary, the limb being very narrow. The tip is slender and entire. (Plate **79**, fig. 1). Excepting on the anterior somites (first six uncinigerous) the uncini of the thoracic tori are arranged in a double interlocking series, those of the one series progressive and of the other regressive. The uncini bear at the apex one tooth above the long principal one. Toward the middle of the side toward the large tooth and a little proximad of its tip is a small point or tooth. The base is rounded and not at all prolonged. On the convex side is the usual shoulder, which is pronounced and angular. (Plate **79**, fig. 2).

The uncinigerous tori of the abdomen are short and more or less elevated, or salient. On them the uncini are arranged in a single series. The posterior uncini differ conspicuously from the thoracic in that the base is much prolonged in a slender acute process somewhat like those, *e.g.*, in species of Pista. Including this the uncini are considerably longer than those of the thorax. (Plate **79**, fig. 3).

LOCALITY. Panama: Perico Island. 12 March, 1891. Three specimens, two of which are broken.

EUPOLYMNIA INSULANA, sp. nov.[1]

Plate **79**, fig. 4–6.

Color somewhat brown, in part of a vague greenish cast.

The type is in two fragments, which have a combined length of 40 mm. and comprise a total of sixty-six somites. At the twelfth somite the width is 4.2 mm. The anterior region not strongly inflated, the body narrowing but moderately in going caudad.

The prostomium forms a smooth fold bent into a semicircle open below, like a conspicuous upper lip. Behind this is a narrower, transverse, incomplete ring, which in other related forms bears the tentacles, three in the type of the present species being all missing; the ring extends ventrally on each side the same distance as the smooth fold and bears throughout its length a dense series of thin lamellae, which cross it longitudinally and completely conceal it. Behind the lamellated region is a transverse series of numerous small, distally rounded papillae. No eye-spots are evident. Ventrally, between the lower ends of the folds above described, there is a thick oblong fold, or lower lip, marked by longitudinal sulci and depressed below the level of the succeeding somite. A half ring is elevated above and laterally caudad of the tentacular lamellated ridge into a thick, rounded ridge, or collar, which is nearly smooth above, but laterally is more manifestly wrinkled. Behind this is a complete ring deepened a little below the level of adjacent parts; ventrally it extends forward between the ventral ends of the collar, and is there along its anterior border elevated into a low, rounded ridge behind which the surface is strongly wrinkled and tubercular; the roughening also affects the lower part of the sides of the ring, but not the dorsum.

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[1] insulanus, insular.

The next somite is ventrally much shorter than the preceding or the following one; it is broadly elevated ventrally along the anterior border, the elevation becoming higher laterad and on the lower part of each side forming a low, thick, somewhat twisted, lobe, or flap; the elevation and lobes are longitudinally creased or wrinkled. In the next, or third, somite this elevation is not present in the median ventral region, which is depressed and usually marked off in large areas by anastomosing sulci, but at the sides of the venter the border is similarly elevated into a low, rounded ridge, which, on the lower part of each side, but a little more dorsad than in the preceding somite, develops into a fold larger than the preceding one. The next, or fourth, somite is similarly modified, but the median ventral region, free from a distinct ridge-like fold, is larger. No such ridges and folds are present on following somites.

As judged by scars, there are three pairs of branchia; of these, two branchiae on the right side alone remain in the type, and the caudal, a member of the third pair (or fourth somite), is much the larger and more complicated. It is 1.8 to 2 mm. long, and has a stout cylindrical trunk, constituting the greater part of this length, and gives off on one side a branch, which immediately breaks up into three or four other branchings, each of which divides twice, or less commonly, thrice, the final one or two branches being dichotomous and the ultimate branches comparatively short and thick; several other, closely overlapping branches arise farther distad, these presenting the same mode of branching. The second branchia, in line with and immediately in front of the one just described, presents a much more slender stalk, at the distal end of which are three short and undivided branches; a scar proximad of them probably represents a fourth branch that has been broken off.

There is a pair of conspicuous segmental papillae on each somite from the third to the eighth inclusive. The first ones lie each on caudal border of somite between the level of the branchia and the notopodium. The others descend in position ventrad in going caudad, the second and third ones lying between notopodia of adjoining somites, the others ventrad of the notopodia.

There are the normal seventeen setigerous somites. The ventral plates remain of essentially the same length throughout and decrease in width but moderately caudad. Each is marked off by sulci into a double transverse series of subquadrate areas.

The notopodia are short. The cross-section at the base is oblong or narrowly elliptic, with the long axis dorsoventrad. Distally each is compressed in the anterocaudal direction. The distal edge is oblique, the upper angle being farthest extended. The uncinigerous tori of the abdomen are, in the anterior region of the abdomen, low, with the dorsoventral length long. Caudad they become shorter in the dorsoventral direction and longer from the base distad.

The notopodial setae are stoutest at base and distally finely pointed. The distal half is narrowly bilimbate. The shafts throughout are finely fibrillate. (Plate **79**, fig. 4).

The thoracic uncini form the usual long, straight series between notopodia and ventral plates. They first occur on the fifth somite. On somites from the fifth to the tenth, inclusive, the uncini appear to be arranged in a single series, whereas in all succeeding ones of the thorax the series is clearly a double and completely interlocking one. On the abdominal tori the series are single. The uncini of the thoracic region are squat in form, with but a single transverse row of usually few teeth above the principal tooth, or fang. The opposite end is narrowly rounded, not prolonged. The shoulder on the convex side is angular. At the middle of the opposite side there is one obtuse angular projection. (Plate **79**, fig. 5). The uncini of the abdominal region, in general, are similar, but there may be two series of teeth above the fang, and the opposite end of the uncinus is moderately prolonged and narrowly acute. (Plate **71**, fig. 6).

LOCALITY. Galapagos, 4 miles S. E. of Hood Island: Sta. 4642 (lat. 1° 30′ 5″ S., long., 89° 35′ W.). Depth 300 fms. Bottom of broken shells and Globigerina ooze. Bottom temp. 48.6° F. 7 November, 1904. One specimen.

THELEPUS Leuckart.

Archiv naturg., 1849, **15**, p. 169; ST. JOSEPH, Ann. sci. nat., 1894, ser. 5, **17**, p. 183.
Lumara STIMPSON, Invertb. Grand Manan, 1853, p. 30.
Venusia JOHNSTON, Cat. Annelids Brit. mus., 1865, p. 241.
Neottis MALMGREN, Öfvers. K. vet. akad. Förh., 1865, p. 388.
Phenacia QUATREFAGES, Hist. nat. annelés, 1865, **2** p. 374.
Heterophenacia QUATREFAGES, *Ibid.*, 1865, **2**, p. 389.
Thelepodopsis SARS, Forh. Vidensk. selsk. Christiania, 1872, 1871, p. 415.

THELEPUS PERICENSIS, sp. nov.

Plate **80**, fig. 4–6.

Yellow, of a weak brownish cast. The branchiae and tentacles brighter yellow.

Body anteriorly broad, very conspicuously narrowed and tapering caudad, strongly narrowed from the fifteenth somite cephalad and also narrowing from the same region caudad to the twentieth somite, there of nearly uniform width to about the twenty fifth, from where it again strongly narrows to the much more slender posterior division of the body, the caudal end of which is strongly tapered, with the tip pointed. The anus is a smooth, funnel-shaped, opening, with the sides weakly grooved, but without processes. The number of somites in the type is one hundred and ninety-five, or about that number. The greatest width of thorax, 7 mm.; the width caudad of the thirtieth somite, from 3.3 to 3.5 mm. The length difficult to determine because of the coiling of the body, but not far from 155 mm.

The prostomium presents a dorsal flap of moderate size, which is transversely wrinkled, as is common. On each side there is a conspicuous band of eyes. The tentacles long and slender, grooved, the grooves not strong.

The branchial filaments form three continuous transverse rows without any distinct clear space in the middorsal region. The filaments are slender, decidedly more so than the tentacles, and are strongly curled in a spiral. They are numerous and closely aggregated, and extend down on each side to, or in the case of the first series, below, the level of the lower edge of the notopodial processes.

Segmental papillae are present under the setigerous processes on the second to fifth setigerous somites.

The setae begin on the third somite, and are found on all the succeeding somites excepting at the caudal end. The setae are short and acutely pointed.

Each is bilimbate, with apical portion smooth and entire. Uncini begin on the fifth somite (third setigerous) and are present on all succeeding ones except a few at the caudal end. Each uncinus has the long, shoe-shaped base characteristic of the genus. The small, button-shaped process on the dorsal side at or scarcely removed from the end, with below this on the end a slight angular prominence. At the apex there are two smaller teeth above the principal one, which is very long.

LOCALITY. Panama: Perico Island. 12 March, 1891.

TEREBELLIDES M. Sars.

Beskriv. og lagtt. 1835, p. 48; MALMGREN, Öfvers. K. akad. Förh., 1865, p. 396.

TEREBELLIDES EURYSTETHUS, sp. nov.[1]

Plate 80, fig. 7–15.

The color is yellow throughout.

The thorax is broad anteriorly, the broad region narrowing moderately cephalad and abruptly caudad near the twelfth setigerous somite, the posterior setigerous somites being nearly uniform in diameter with those of the abdomen. The body is dorsally convex and ventrally flattened, as usual. The abdomen is ventrally longitudinally furrowed. The maximum width of the thorax in the type is, exclusive of the parapodia, 6 mm. The width of the last setigerous somite is 2.5 mm., this being near the width of most of the narrower region of the body. The length of the type to the end of the last setigerous somite is about 30 mm. The total number of somites in the paratype is sixty, or about that number.

The prostomium is a prominent lobe which widens forward like the end of a trumpet, the anterior end being broad and flat, with the edge wavy or folded. The disc bears numerous tentacles, which are very short, fine, and filiform throughout their length.

The prostomium ventrally forms a large and conspicuous lower lip, which is depressed transversely near the middle of its length and is widened distad, its lateral angles projecting laterad over the base as conspicuous, more or less angular, processes. The anterior edge is long and nearly straight.

The branchia has nearly the general form and proportions as in *T. stroemi.*

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[1] *εὐρὺς*, broad, and *στῆθος*, chest.

The principal, or anterior, branches are large; anteriorly they extend anteroventrad of the point of attachment to the stalk; the lamellae are large and densely arranged. The posterior, or inner, branches are free a shorter distance than in *stroemi*. They are less attenuated distad, the end being bluntly rounded and having a short, slender filament.

The first segment is prominent ventrally and laterally; it is widest on the sides; ventrally it presents two deep, submedian, longitudinal sulci.

The second somite is also prominent, being carried ventrad nearly as far as the first; ventrally it is of nearly the same length as the first, but it narrows laterally instead of widening.

The third somite is of nearly the same length ventrally as the second, and is of uniform length throughout. The fourth and fifth are narrower ventrally and wider laterally. The succeeding somites to the twelfth setigerous are much shorter ventrally than the anterior ones and wider up the sides. The other thoracic somites, which are in the much narrower caudal division of the body, are much more elongate; ventrally, in line with the parapodia, they bear conspicuous, thickened, light-colored, glandular tori.

The abdominal somites decrease in length gradually caudad, the last twenty to thirty being especially short and closely arranged; the last few somites narrow rapidly, making the caudal end round in conspicuously to the small pygidium.

The first notopodia are short and rounded; the others are longer, but remain throughout the broad division of the thorax relatively short and stout, subcylindrical and distally rounded; those of the narrow division of the thorax are of same proportion, excepting the most caudal, which are somewhat more slender. (Plate 80, fig. 9).

The uncinigerous tori begin on the sixth setigerous somite, as usual.

The pinnulae of the abdomen are prominent. Those of the posterior half present distally a prominent, caudoventral process and a less prominent, cephalodorsal one, the distal end expanding over the base. (Plate 80, fig. 8). On the anterior abdominal somites these pinnulae are shorter. (Plate 80, fig. 7).

The capillary setae of the first somite are shorter and finer than the others. In general, the setae are obviously coarser than in *stroemi* and are constantly a little bent toward the distal end. The wing of one side is much wider than usual in *stroemi*. (Plate 80, fig. 10).

The thoracic uncini have the long, distally somewhat curved stalk, as usual; the neck is not especially pronounced, the stalk below the head being but little narrower than more proximally. In profile there appear on the crown four or five slender teeth above the short fang. The fang is scarcely curved; its distal upper edge is convex, its lower one straight, or but slightly concave; below where its lower edge meets the stalk the latter weakly bulges. The projecting caudal region of the crown is higher and less widely rounded than is usual in *stroemi*. (Plate **80**, fig. 11).

The abdominal uncini have the usual short broad base. In profile, above the large tooth, there may appear either one or two smaller teeth. The crown of smaller teeth bends commonly about the base of the large tooth in a single series of six or seven teeth; but rarely one or more teeth are partially crowded out of the series above. The characteristic form of the base is shown. (Plate **80**, fig. 12-14).

Localities. Between Panama and the Galapagos Islands: Sta. 4631 (lat. 6° 26′ N., long. 81° 49′ W.). Depth 774 fms. Bottom of green sand. 3 November, 1904. One specimen (type), of which the caudal end is lacking.

Off Peru: Sta. 4666 (lat. 11° 55′ S., long. 81° 20′ W.). Depth 2,600 fms. Bottom of fine grey radiolarian ooze. 18 November, 1904. One specimen.

Ampharetidae.

These are polychaetes of small or medium size in which the body is convex above and flattened below. The body presents two regions, of which the anterior, or thorax, is broad and the posterior, or abdomen, much narrower. The thoracic division has biramous parapodia and bears both simple capillary setae and uncini, while nearly always the parapodia of the abdomen are represented only by the uncinigerous neuropodia, though rarely (Otanes) the notopodial setae continue to the end of the body. In addition, the first one or two somites are set off together with the prostomium in such a way as to present a distinct anterior region apart from the rest of the thorax. A longitudinal midventral groove is present along the abdomen, and lateral folds ordinarily separate the dorsal from the ventral regions of the body.

The prostomium is distinct and varied in form, the frontal region sometimes expanded into a distinct lobe, which may be very prolonged (Moyanus). Below this lobe the filiform tentacles, which may be either smooth or ciliated, are borne about the border of the mouth, within which in most cases they are retractile. Sometimes there is a distinct tentaculiferous lobe projecting below the frontal one, and this may rarely be strongly extended and formed into a long proboscis or proboscis-like tube (Pabits). In some forms the tentacles are wholly absent. The eyes are two, or numerous. Nuchal organs are present either as simple, nonextrusible, ciliated furrows or as pits surrounded with a ridge, or cushion.

Ventral glands are strongly developed and normally form obvious cushions extending entirely across the somites of the thoracic region.

The first parapodia appear normally on the fourth somite, where they are often reduced and bear weakly developed setae. Simple setae may be present also on the second and third somites, *e.g.*, in Melinna. The parapodia of the thoracic region, excepting in most cases a few of the most anterior ones, are biramous, with the notopodium prominent and cylindrical or conical, while the neuropodium is in the form of a pad, or lamina, the torus, or pinnule. The first uncini begin in most cases on the sixth or seventh somite, but may begin on the fourth at the same time as the notopodials. In the abdominal region, in the great majority of cases, only the neuropodia, or pinnules, are present; but, in some, achaetous tubercles may be present above these, and the tubercles more rarely may bear capillary setae to the end of the body. Cirri absent, or of variable development.

The setae are of two types. The notopodials are capillary, simple, and laminate. The neuropodials are in the form of minute pectinate plates, or uncini, much resembling those of the Terebellidae. In addition, a third type of seta is present in certain genera. These are the stout blades, or paleae, that may form two transverse series on the third somite. They are really the dorsal, or notopodial, setae of that somite, the parapodia being represented only by the tubercles, or ridge, from which the paleae arise on each side.

One or two stout spines, or hooks, may be present on each side of the dorsum, just behind the branchiae.

There may be two, three, or four pairs of branchiae, four pairs being the most common number. They are inserted dorsally, with the first pair on the third somite, a pair also being present on each following somite to the sixth, inclusive, when the full number, or four pairs, are present. The branchiae are nearly always smooth, distally acuminate, and unbranched, or they may all or part of them be branched.

The nephridia occur in the thoracic region and number from three to five pairs, the first lying normally in the fourth or fifth somite back of an intrathoracic diaphragm, which divides the thoracic cavity unequally. They open into the body-cavity, and the external opening, or nephridiopore, is in each case situated at the base of the corresponding neuropodium.

The pharynx is short, with its dorsal portion alone ordinarily protrusible and carrying forward the tentacles when extruded. The pharynx is followed by a short oesophagus, a voluminous stomach, occupying most of the thorax and narrowing caudad, and an intestine. At the anterior end of the stomach there may be present two short lobes ordinarily reddish or yellowish in color, while in some there is a highly peculiar internal caecum filling much of the cavity of the stomach.

The ampharetids are very sedentary in habit, living in tubes which they neither leave nor move about. The walls of these tubes are normally composed of fine mud over a lining membrane that is thin but usually tough. The tubes are commonly buried in a vertical position in the mud of the bottom frequented by the animals. The ampharetids that have been observed live upon such small forms as species of Diatomaceae, Foraminifera, Globigerinae and other Protozoa, microscopic Algae and algal spores. In securing such forms *Ampharete grubei*, for example, thrusts its anterior region from the mouth of its tube, at the same time extruding its tentacles and sweeping them about over the adjacent surface. Through the action of the tentacles and the cilia upon them small balls of material are rolled up mixed with some mucus, these balls being passed into the mouth and, when sufficient has been accumulated, are swallowed.[1] The alimentary canal of various species when opened is found to contain commonly fine mud mixed with the spicules of sponges, frustules of diatoms, shells of Foraminifera, sometimes the setae of annelids, etc.

The ampharetids are more or less limited to comparatively cold water, for which reason they are rare in collections from the littoral zone of tropical regions but abound in the Arctic, Subarctic, and Antarctic regions and in other regions, at the lower depths in the ocean. Of the fifteen species of this family secured during the explorations of the CHALLENGER, ten were dredged at depths of from 1,100 to 2,700 fms; and, of the nine species recorded below, three were secured at depths below 2,200 fms. and none came from above the 493 fm. level.

Key to the Subfamilies and Genera.

a. Paleae present. . . . . *Ampharetinae.*
  b. Capillary setae present to the caudal end of the body. . . . . *Olanes* Kinberg.
  bb. Capillary setae confined to the anterior, or thoracic, region.
    c. Fourteen somites bearing capillary setae; tentacles ciliated.
      d. With three pairs of branchiae; paleae and chaetopods lacking on third segment. *Neosabellides* Hessle.

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[1] *Cf.* Fauvel, Recherches sur les ampharetiens, Bull. sci., 1897, **30**, p. 373.

dd. With four pairs of branchiae.

e. Notopodia of thirteenth segment shoved dorsad.......... *Anobothrus* Levinsen.

ee. None of notopodia shoved dorsad.......... *Ampharete* Malmgren.

cc. More than fourteen somites bearing capillary setae.

d. Fifteen somites bearing capillary setae.......... *Sosane* Malmgren.

dd. More than fifteen somites bearing capillary setae.

e. Sixteen somites bearing capillary setae.......... *Lysippe* Malmgren.

ee. Seventeen somites bearing capillary setae.

f. Three pairs of branchiae.......... *Aryandes* Kinberg.

ff. Four pairs of branchiae.

g Notopodia with cirri.......... *Amphictius* Grube.

gg. Notopodia without cirri.......... *Lysippides* Hessle.

aa. No paleae present.

b. One or two stout dorsal spines caudad of the branchiae on each side; number of somites large, near seventy or more.......... *Melinninae.*

c. With two pairs of branchiae, these all pinnately branched.......... *Oeorpata* Kinberg.

cc With four pairs of branchiae, all, or at least part, of which are simple.

d. With a greatly prolonged, flattened, and relatively narrow process extending forward from the anterior face of the prostomium above the tentacular lobe; two spines on each side caudad of the branchiae.......... *Moyanus*, gen. nov.

dd. With no such elongate prostomial process; a single spine caudad of the branchiae on each side.

e. Branchiae all simple, cirriform; eighteen somites bearing capillary setae.
Melinna Malmgren.

ee. Inner branchiae on each side pinnately branched, the others cirriform; seventeen somites bearing capillary setae.......... *Isolda* F. Müller.

bb. No postbranchial stout spines; the number of somites from twenty to fifty-five, but usually less than forty.......... *Samythinae.*

c. No tentacles.

d. Fifteen pairs of fasciae of capillary setae; four pairs of branchiae.

e. Tentacles of one type, simple, smooth.......... *Phyllocomus* Grube.

ee. Tentacles of two types, one simple and the other pinnately branched.
Schistocomus Chamberlin.

dd. Fourteen pairs of fasciae of capillary setae; branchiae two or three pairs.

e. Two branchial filaments, basally connate, on each side.......... *Auchenoplax* Ehlers.

ee. A group of three branchial filaments on each side.......... *Glyphanostomum* Levinsen.

cc. Tentacles present.

d. Fourteen somites bearing capillary setae.

e. Tentacles ciliated.......... *Sabellides* Milne Edwards.

ee. Tentacles smooth.

f. Frontal lobe of prostomium much broader than long, with no processes or tubercles at the anterior corners; uncini with five teeth, the inferior lobe narrow and subacute.
Amage Malmgren.

ff. Frontal lobe of prostomium narrow, about as long as wide, and with a tubercle at each anterior corner; uncini broad, with four teeth (double), the inferior lobe broad and very blunt.......... *Grubianella* McIntosh.

dd. Fifteen or more somites bearing capillary setae.

e. Fifteen somites bearing capillary setae.

f. With two pairs of branchiae.......... *Melinnopsis* McIntosh.

ff. With three or four pairs of branchiae.

g. With four pairs of branchiae.......... *Sosanopsis* Hessle.

gg. With three pairs of branchiae.

h. Branchiae in two well-separated groups; tentacles borne on a conspicuous prosbosciform organ nearly a third as long as the thorax, inclusive of prostomium proper; no tubercles above abdominal pinnules.......... *Pabits*, gen. nov.

hh. Branchiae in a continuous transverse series without median interval; tentaculiferous region not thus prolonged into a prosbosciform organ; a tubercle above each abdominal pinnule.......... *Samythella* Verrill.

ee. More than fifteen somites bearing capillary setae.

f. Seventeen somites bearing capillary setae; three pairs of branchiae.

g. Prostomium with a prominent tubercle at each anterior corner above; uncinus (in type) with eight teeth and a process in the interval above the inferior process. *Samythopsis* McIntosh.

gg. Prostomium with no tubercle at each anterior corner; uncinus (in type) with but five teeth and with no process in the interval above the inferior process.

h. With three pairs of branchiae . . . . *Samytha* Malmgren.

hh. With four pairs of branchiae . . . . *Amphisamytha* Hessle.

ff. Eighteen somites bearing capillary setae; four pairs of branchiae . . . . . . *Paiwa*, gen. nov.

Because of the incompleteness of the description given by McIntosh (Challenger Annelida, 1885, p. 441, pl. 27A, fig. 18) of *Melinnopsis atlantica*, type and only known representative of the genus, the position of that form is somewhat doubtful. No mention is made of postbranchial spines and it is assumed that they are absent. If the form should really prove to belong in the group with Melinna, its place in the key would be with Oeorpata, from which it would be readily separable in having its branchiae simple.

Eusamytha McIntosh (1885) is not included in the key because its separation from Samythella Verrill (1873) is not sufficiently clear, Verrill giving neither description nor figure of the uncinus, and McIntosh likewise omitting some important points and giving no generic diagnosis. The types of both genera, *pacifica* and *elongata* respectively, have the number of somites larger than usual in the Samythinae.

AMPHARETE Malmgren.

Öfvers K. vet. akad. Förh., 1865, p. 362.
Branchiosabella CLAPARÈDE, Beobacht. anat. entw. wibell. thiere, 1863, p. 34.
Anobothrus LEVINSEN, Öfvers. Nordiske Annulata, 1883, pt. 2, p. 161, 165.

AMPHARETE HOMA, sp. nov.[1]

Plate 77, fig. 7, 8.

The color at present is dusky brown, with prostomium and peristomium appendages, etc., yellowish.

The body anteriorly is of but moderate width, is cylindrical, and of uniform width and depth. It is more slender posteriorly, but similarly cylindrical and uniform caudad of the middle, excepting at the caudal end, which is pointed. The total length is 39 mm., and the diameter in the anterior region 2.5 mm. There are fourteen setigerous somites and twelve in the abdominal division.

The prostomium is much depressed below the level of the dorsum of the body, from which it slants steeply. In outline, as seen from above, it is roughly trapeziform, but with a median triangular lobe projecting forward from the middle of the anterior border. From the caudal end of each edge of this lobe a deep sulcus runs back on the peristomium a little ectad of caudad, the two sulci being connected across the caudal end by two transverse furrows. Scars seem to indicate that some tentacular processes in life arise above these longitudinal sulci, but none are now present in the type. The prostomium ventrally is concave, there being a concavity for each of the three lobes, the three fusing into the large general concavity of the main prostomial lobe. From this concave surface arise slender, cylindrical tentacles, of which most are lost in the type.

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[1] ὁμὸς, uniform.

The lower lip is a large transverse lobe distinctly separated off laterally and caudally by a deep furrow. The lobe is wide, with both anterior and posterior border convex at the middle, arcuate. It is crossed by two sulci, the more caudal of which extends entirely across, while the anterior one extends only across the caudal part of the convex mesal region.

The paleae are not flattened, being capillary setae less coarse than usual and with fine tips which are straight, or but slightly curved. They are colorless, or nearly so, lacking the usual golden lustre. In each series there are eleven paleae, which decrease in length caudad, the most caudal very short.

There are four pairs of branchiae. Of the branchiae on each side, three form an anterior transverse series continuous with the three of the other side, all in the series being contiguous at base. The fourth branchia on each side is caudad of the interval between the second and third branchiae from the ectal end of the series and lies in close contact with these two branchiae. It has its base prolonged caudoectad. All branchiae in the type are broken off close to the base.

The first two setigerous somites are not separated dorsally by an intersegmental furrow. The oblique furrows from the posterior tentacles, one on each side, set off a large, smooth, triangular arc, with apex between the median tentacles of the transverse series, the apical region of the area being set off by a transverse furrow, this anterior piece corresponding apparently to a distinct ventral band of the presetigerous somite, on which the paleae are borne. This ventral piece is incised anteriorly at each end, leaving a rounded lobe just beneath the paleae. Laterally this somite is fused with the succeeding one and this in turn, but more weakly, with the third. There is in the type a small scar just caudad of the paleae on each side, from which possibly a cirriform process has been lost. The first two setigerous somites are clearly separated ventrally, the first one being divided by a transverse furrow and much exceeding both the preceding and the following somite in length. The third and immediately following setigerous somites are sharply separated from each other dorsally, ventrally, and laterally. Dorsally each of these somites is distinctly double, a deep transverse sulcus separating off an anterior division from a longer posterior one, at the ends of which the parapodia arise. The posterior dorsal division of the fifth setigerous somite is crossed by a narrow, transverse, dark band, of which no trace is detectable on other somites. Caudad of this the furrow dividing the somites becomes weaker and in the posterior thoracic region is wholly absent, the line between the somites also becoming weak. These posterior thoracic somites at the same time increase very much in length in comparison with the anterior ones. The abdominal somites are also very long in comparison with their width. The sides of the thoracic somites project out abruptly just below the notopodia, which in consequence appear to arise in a longitudinal depression. In front of and opposite the upper end of the elevated lateral region of each thoracic somite is a similarly prominent glandular area which becomes more elongate caudad.

The first parapodia are in the form of small, rounded tubercles. The second are longer, while the third increase abruptly to much nearer the typical size. A typical notopodium is subcylindrical, widening at base, narrowing a little distad, and toward the distal end more abruptly so. Those of the longer posterior somites are not increased in length. The uncinigerous tori begin on the third setigerous somite. Each is a small, somewhat auricular lobe, attached on the caudal side of the somite a little below the level of the notopodium. The abdominal tori are situated at the caudal end of each somite. Each is a thin lobe, short, and of moderate width, with the free distal margin straight or weakly convex, and the width a little less across the base than across the distal end.

The notopodial setae excepting on the most anterior somites much exceed the notopodia. The setae are moderately coarse, with strongly fibrillated shafts. Distally each is weakly bent, or geniculate, the region beyond the bend narrowing distad and running out into a very fine tip which curves a little in the opposite direction. Each is bilimbate from just below the first curve distad to the base of the slender tip, the wings narrowing gradually to its ends. In a view at right angles to the plane of the curve only one limbus is visible, this then appearing rather broad. (Plate 79, fig. 8). The uncini are arranged in single series. They are very small. Across the serrate edge there are usually six series of teeth and at one end the usual rounded prominence, between which and the teeth there is a small subnodular tooth, or process. The nonserrate margin is somewhat convex and projects in a prominent angular shoulder well toward the end opposite that on which occurs the rounded prominence of the opposite side. The uncinus is clearly cross-striate. (Plate **77**, fig. 7).

Locality. Gulf of California: Sta. 3435 (lat. 26° 48′ N., long. 110° 45′ 20″ W.). Depth 859 fms. Bottom of brown mud with black specks. Bottom temp. 37.3° F. 22 April, 1891. One specimen.

A number of broken tubes apparently pertaining to this species were taken with the specimen. They are thick walled, of varying diameter, and composed of fine brownish mud.

AMPHICTEIS Grube.

Archiv naturges., 1851, **17**, p. 82; 1860, **26**, p. 103.
Crossostoma Gosse, Ann. mag. nat. hist., 1855, ser. 2, **16**, p. 310.

AMPHICTEIS OBSCURIOR, sp. nov.[1]

Plate **76**, fig. 1, 2; Plate **77**, fig. 3.

Color above, black of bluish cast, below, more greyish black in the anterior region and bluish black posteriorly. Setae pale, in one paratype of dilute bronze cast, but not at all yellow or golden.

Greatest width, 5 mm., this being at the fifth and sixth setigerous somites.

Prostomium narrowed cephalad, the anterior margin incised at middle and convex on each side adjacent to the incision, straight ectad. At the base above strongly elevated, the elevated portion rounded and marked with a short median longitudinal sulcus. In front of the elevated region and near the middle of the length of the lobe it is strongly depressed transversely. A median longitudinal furrow extending caudad from the anterior notch to the transverse depression, where it is bifurcate. (Plate **76**, fig. 1, 2).

The peristomium presents a large well-defined lower lip. This is subtrapeziform in outline, but with the narrower anterior edge moderately convex and the anterior corners well rounded. A little back of the middle is a transverse sulcus which bows forward convexly at the middle and sends a short branch caudomesad on each side of the beginning of the convexity. There is a dark transverse stripe across the middle of the part of the lip in front of the sulcus, and in front of this stripe the lip is somewhat elevated along its anterior border. (Plate 76, fig. 1, 2).

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[1] obscurus, dark.

The branchiae are broken off at their bases. The inner posterior branchiae are much thickest, the anterior inner ones being next in size. Between the inner anterior branchiae there is the usual transverse fold which extends back as a broad, cuneate tongue between bases of the two posterior branchiae.

Dorsum strongly convex. It is finely transversely striate. Excepting the first few, the intersegmental furrows are not pronounced between the somites above. The venter is much less convex, flattened. Excepting the first few, the somites of the anterior region below are bisulcate from the caudal edge cephalad nearly across the somite. The anterior margin is angularly extended forward at the middle.

The notopodia are short and conical. The first ones, as usual, reduced, papilliform, and lying in a furrow which in the type seems to continue caudad along the sides considerably farther than usual. The pinnae are distinct on the fourth and succeeding somites. They are thin, elongate transversely, with the ectal end free and pointed.

Paleae on each side nineteen, these decreasing in length dorsoectad, as usual, the two most dorsal being finer and almost capillary. As seen from above, the paleae curve moderately and evenly from base to tip. Narrowed to an acute tip which is straight and not much drawn out, being nearly the same in form as in *A. orphnius*. Length of longest palea 2.5 mm.

The capillary setae slender and finely acuminate, with the tips a little curved. Wings narrow. Maximum length 1.8 mm., being clearly shorter than the paleae. Uncini proportionately longer and narrower than in *A. orphnius* and with a correspondingly larger number of teeth, there being uniformly seven of these fully developed and one rudimentary one above the inferior process. (Plate 77, fig. 3).

LOCALITY. Off Mexico: Sta. 3417 (lat. 16° 32′ N. long. 99° 48′ W.). Depth 493 fms. Bottom of green mud. Bottom temp. 40.6° F. 11 April, 1891. One specimen, with caudal region missing.

AMPHICTEIS UNCOPALEA, sp. nov.[1]

Plate 76, fig. 5, 6; Plate 77, fig. 4.

The dorsum is blackish, as is also the venter posteriorly. The head and the venter anteriorly are more brownish.

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[1] uncus, hook, and palea.

The type-specimen has apparently been at some time partly dry. It is widest at the anterior end just back of the first setigerous somite, where it has a width of 4 mm.

The prostomium presents above a subcordate elevation which is transversely wrinkled, two of the furrows being deeper than the others. In front of this elevation is a lower part crossed by two contiguous, submedian, longitudinal ridges which extend to the mouth. Tentacles slender and cylindrical, not clavate. (Plate **76**, fig. 5, 6).

The peristomium is produced into a distinct lower lip which flares out ventrad along its distal edge. From near each anterolateral corner a furrow curves caudomesad to the caudal border, the furrow being deepest caudad and having its convexity ectad. A weaker transverse furrow connects these two near the middle of the lip. (Plate **76**, fig. 5, 6).

The dorsum is strongly convexly arched and transversely finely striate. The venter much less convex and somewhat flattened. The somites increase conspicuously in length from the most anterior ones to the caudal end of the anterior division of body.

The fold between the branchiae is wide and conspicuously elevated, with the anterior transverse arms moderately short. At the anterior and posterior end is a pair of submedian, longitudinal sulci. (Plate **76**, fig. 5).

The paleae seem to be normally fifteen in number on each side, these all well and uniformly curved throughout length excepting the slender capillary tip, which is bent back into a hook or curved into a loop. Widely spreading, long, extending beyond head, the longest being 3.4 mm. long.

The capillary setae are long and slenderly acuminate, as usual, with the wings very narrow. The longest are about 2 mm. long, being thus much shorter than the longest paleae. The uncini of the anterior region have a general form much like that of those of *obscurior*, but with only six teeth in addition to the rudimentary one above the inferior process. The uppermost tooth is short and slender. Dorsal edge proportionately long, longer than in either of the two other species here recorded. (Plate **77**, fig. 4).

Locality. Off Mexico: Sta. 3424 (lat. 21° 15′ N., long. 106° 23′ W.). Depth 676 fms. Bottom of grey sand with black specks. Bottom temp. 38° F. 18 April, 1891. One specimen, of which caudal portion is missing.

This species is characterized among other features by the conspicuously spreading paleae, which are uncinate or curled at distal ends instead of being straight or nearly straight, as in the preceding species. The prostomium and the lower lip are of distinctive form. The uncini have fewer teeth than *obscurior* and the same number as *orphnius*, but are longer and proportionately more slender than in the latter and have a longer dorsal edge, as shown in the figures.

AMPHICTEIS ORPHNIUS, sp. nov.[1]

Plate 76, fig. 3, 4; Plate 77, fig. 1, 2.

Color in general a nearly uniform dusky brown. A paler median ventral longitudinal line, which is broader and less clearly marked cephalad. Labial portion of peristomium crossed by a dark stripe. Setae dilute golden yellow.

Length of type 27 mm. Greatest width anteriorly, 4.3 mm., this being in the region of the fourth and fifth somites. Width in the caudal region, 1.5 mm. The caudal division long and slender. Dorsum strongly convex, the venter more weakly so anteriorly, and in caudal region flat.

Prostomium presenting above a subquadrate plate or elevation which is incised at its middle in front and convex on each side of the incision. This plate with a distinct median longitudinal furrow above. Its posterior margin concave. In front of and beneath this dorsal plate is a lobe triangular in outline as seen from above, but with the apex truncate. It bears along its anterodorsal surface two narrow, longitudinal, submedian ridges extending about the end to the mouth region. Tentacles clavately thickened distad. (Plate 76, fig. 3, 4).

Peristomium extended into a conspicuous lower lip which is moderately convex and has its anterior and lateral margins together forming a subsemicircular outline. A dark transverse stripe crosses the lip near its middle, behind this the color paler. (Plate 76, fig. 3, 4).

Seventeen anterior somites bearing fascicles of capillary setae. The setae in the fascicles of the first two somites few and short, on the other somites more numerous and increasing regularly in length caudad to those of the seventeenth somite, which are about 2.2 mm. long. The somites of the anterior region increase in length caudad, the last three being decidedly longest. The first four pairs of fascicles arise on each side in a longitudinal furrow or depression, the processes being scarcely evident in the case of the first two pairs, but distinct in the case of the third and fourth. On the succeeding thirteen somites the notopodia are moderately long, slenderly cylindrical or conicocylindrical. The uncini on the anterior somites arise from simple furrows in the general surface; but caudad distinct pinnulae become evident and more and more elevated. The pinnulae of the anterior region are much elongated transversely, the width always much exceeding the length. In the caudal division the pinnulae are narrower and much more elongate, distally flattened in a caudocephalic direction and somewhat expanded; the distal edge straight or slightly convex, and bearing fewer uncini than those of the anterior region, where they are very numerous.

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[1] ὀρφναῖος, dusky.

Between the bases of the two inner anterior branchial filaments is a transverse elevation, or fold, which is mesally extended as a broad tongue caudad between the inner posterior branchiae. The branchiae in the type are broken off near their bases.

The paleae on each side thirteen in number, these increasing in length from the most ectal to the most mesal. Evenly conspicuously curved throughout most of length, and narrowing evenly distad to a slender acute tip. (Plate 77, fig. 1). Length of exposed portion of longest palea, 2 + mm., or nearly as long as the lateral setae.

The capillary setae in the type about 2.2 mm. long. They are slender and finely acuminate distad. The wings are but slightly developed, being narrow and almost of uniform width and the setae but little wider at middle than at base. The uncini with eight teeth, or seven in addition to the bluntly rounded inferior process. Of these seven the one adjacent to the inferior process is rudimentary, being short and fine and occasionally not at all detectable. (Plate 77, fig. 2).

The tube consists of a wall of greenish black mud over a lining membrane. It is 8.5 mm. in diameter at mouth, with the wall about 1.75 mm. thick. It is distally cylindrical and at bottom subconically narrowed.

LOCALITY. Off Mexico: Sta. 3417 (lat. 16° 32′ N., long. 99° 48′ W.). Depth 493 fms. Bottom of green mud. 11 April, 1891. One specimen.

MOYANUS, gen. nov.[1]

Body elongate and composed of numerous somites. Fifteen somites bearing capillary setae. Uncini beginning on the first setigerous somite. Pygidium somewhat campanulate; with a series of papillae.

Prostomium presenting two conspicuous lobes, a lower, tentaculiferous one and above this a very elongate, proboscis-like one, which in the type is crenulate along its lateral edges.

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[1] Gosiute, mobi, mo-, snout, proboscis, and ya, carry or bear.

No paleae are present.

Two stout spines, but little exposed, caudad of the branchiae on each side.

Four pairs of proximally stout and somewhat flattened, distally pointed branchiae, with the four of each group arising close together.

Notopodia distinct. No distinct cirri. Thoracic uncinigerous tori immediately beneath the notopodia and forming distinct though not elongate lobes on all but the first few setigerous somites. The abdominal tori small.

Notopodial setae simple, bilimbate. Uncini in a single series on each torus. Uncini not prolonged, pectinate along the free margin as in related genera.

Genotype.— *Moyanus explorans,* sp. nov.

No nuchal hooks are present, such as are prominent in Isolda and most species of Melinna. Such hooks are absent from some species of Melinna, however, *e.g.*, *M. monoceros* Augener and *M. pacifica* McIntosh. A nuchal fold, such as is prominent commonly in these two genera along the anterior edge of the fourth somite, is present, but without teeth and in a weakly developed condition. From Isolda and Melinna, which are otherwise, in general, similar in habitus, large number of somites and general structure, Moyanus is readily separated, particularly by the presence of the conspicuous prolongation of the prostomium above the tentaculiferous lobe. Isolda stands apart in the branched character of part of its branchiae.

MOYANUS EXPLORANS, sp. nov.[1]

Plate 77, fig. 11, 12.

The integument of the anterior half of the body is thin and transparent, or nearly so, and almost colorless, the dark contents of the alimentary canal showing plainly. The posterior region of the body is distinctly pigmented, brown.

Of the specimens studied only the type is complete. It is 114 mm. long and consists of sixty-five somites, or about that number, caudad of the setigerous region, the fraying of the body in two places preventing a wholly accurate count. The total number of somites is thus near eighty-one. The length from the extreme anterior end to the end of the thorax is only 25 mm. The greatest width is 4 mm., this being at the anterior end, from where the body is cylindrical and of essentially uniform diameter to the end of the setigerous region, caudad of which it is much, though gradually, narrowed to just proximad of the extreme caudal end, which is expanded in a subcampanulate manner. The body of the type in the middle and posterior region is conspicuously compressed dorsoventrally.

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[1] explorare, to explore.

The prostomium above is prolonged directly forwards into a remarkable proboscis-like process, which in the type is about 7 mm. long, and if laid back from the base would reach about to the eighth somite. It is flattened dorsoventrally and is of uniform width to the distal end, which is somewhat convexly rounded. Along each lateral edge is a series of crenations, or blunt rounded lobes, from between which a furrow extends a short distance mesad both above and below but quickly fades out, leaving the middle upper and lower surfaces nearly smooth. These cross-furrows give the process in part a segmented appearance. Ventrad of the lobe the prostomium presents a very much shorter tentaculiferous lobe, scarcely more than one third as long as the upper one. This has a broad, slightly convex, ventral surface and in outline, as seen from below, is subtrapeziform, with the distal margin slightly concave. On each side of the ventral surface, beginning near the median line, a stout transverse lobe is set off by deep sulci, and has its ectal tip projecting freely at the side like the tip of an ordinary tentacle, the free portion, however, being short. The other tentacles are attached along the lateral edges of the lobe. On each side of the lobe and toward the anterior end is attached a basally stout, subconically narrowed tentacle which projects forwards, and in length is scarcely, or not at all in excess of the width of the lobe across its anterior end. Caudad of this tentacle and in line with it on each side are two much shorter, distally rounded tentacles, or tentacular lobes, which are distally rounded, and of which the more caudal on one side is slightly divided, the corresponding one of the opposite side being lost.

There are four pairs of branchiae. The four of each group are inserted contiguously. They differ but slightly in length and extend distad to near the middle of the upper lobe, or rostrum, of the prostomium. All are gradually and uniformly attenuated from thick bases to pointed tips. Distally they are subcylindric, but proximally they are flattened and show a median longitudinal furrow. They are smooth throughout, showing no traces of pinnate branches such as occur in Isolda.

On the ventral side there is a wide lower lip, the anterior margin of which is widely concave. The anterior border may be raised, with the median area depressed across the entire width.

In the thoracic region there are fifteen setigerous somites. The dorsum of this region is evenly convex and smooth, with no distinct intersegmental furrows excepting a few at the anterior end, the furrow between the third and fourth setigerous somites being especially distinct, the border on the caudal side of this furrow representing the nuchal fold of Melinna, etc. It is depressed on each side below the level of the sides, the parapodia being attached along the line of depression and becoming more dorsal and approaching nearer to each other at the anterior end, as usual in species of related genera. Ventrally and laterally the somites are separated clearly by deep intersegmental furrows. Somites undivided. Just caudad of the labial lobe a very oblique furrow on each side meets on the fifth somite the one from the opposite side at a very obtuse angle, forming a widely V-shaped mark, in which the arms become less deeply impressed away from the angle. Toward the caudal end of the thorax the somites become much longer than the anterior ones. The somites of the anterior region of the abdomen are long; but they become very short in comparison with their width and closely crowded in the posterior region, those immediately preceding the caudal end being exceedingly short. The caudal end of the body flares out in campanulate manner much as in some maldanids, with the free border divided by radial furrows and with projections like short papillae. The poor preservation of the part prevents more detailed description.

The notopodia of the first few setigerous somites are very small, the first ones scarcely obvious as distinct elevations. In the other parts of the thorax they are distinct and well developed. They are very stout in comparison with length, and distally are compressed to an edge through which the setae emerge. The uncinigerous thoracic lobes project from the caudal edge of the somites just ventrad of the notopodia. The most anterior of these lobes are very broad dorsoventrally in comparison with the anterocaudal length, the free edge straight. Caudad the width decreases regularly and strongly, the lobes in the posterior part of the thorax being very small. The uncinigerous tori of the abdominal region are very narrow dorsoventrally, short, and moderately compressed in the anterocaudal direction.

The notopodial setae of the most anterior and of the most posterior setigerous somites are very short and fine. Those of the typical fascicles are moderate or short. The setae are narrowed distad and drawn out into fine, curving tips. Each seta is curved or geniculate toward or distad of the middle. Each is strongly fibrillate and is distinctly bilimbate from just below the bend distad to the base of the fine tip. (Plate **77**, fig. 12). The setae in each notopodium are in part short and in part considerably longer, the long ones and the short ones forming separate, transverse series. The uncini form a single series on each torus. The proximal side of each uncinus presents the usual shoulder or angle, which is moderate in size, often appears narrowly rounded rather than acute, and is a little nearer one end than the other. On the pectinate side there appear in profile view typically five teeth, of which the one toward the smooth end is more abruptly bent near its middle. The tooth adjacent to it is the largest of the series. (Plate **77**, fig. 11).

LOCALITY. Off Peru: 111 miles northwest of Aguja Point. Sta. 4651 (lat. 5° 42′ S., long. 83° W.). Depth 2,222 fms. Bottom of fine sticky grey mud. Bottom temp. 35.4° F. 11 November, 1904. Three tubes, with animals *in situ*.

Because of the strong resistance of the tubes to penetration of liquid, the specimens are soft and poorly preserved, only the type being complete. The longest of the tubes measures 300 mm. in length, with a diameter of 5.5 mm. They are composed of very fine grey mud and are rather thin-walled.

SABELLIDES Milne Edwards.

Lamarck's Anim. s. verteb., ed. 2, 1838, **5**, p. 608; GRUBE, Archiv. naturg., 1850, **16**, p. 80, 137; MALMGREN, Öfvers. K. vet. akad. Förh., 1865, **22**, p. 362, 368.

SABELLIDES DELUS, sp. nov.[1]

Plate **77**, fig. 13.

The body in general is brownish, dusky anteriorly above. Setae of a very dilute yellow, or brassy tinge, transparent.

Body very strongly narrowed caudad, the caudal division, or abdomen, short and slender; widest at about the seventh somite where the width in type is 3.2 mm. Length of type, 16 mm. Longest branchia near 7.8 mm. long. The dorsum strongly convex, the venter flattened, that of the abdomen having a longitudinal median furrow. The usual fourteen somites bearing capillary setae. Uncini beginning on the third setigerous somite.

Prostomium strongly convexly rounded above. On each side a longitudinal furrow. A deep transverse sulcus across proximal portion. At its anterior end protrudes a lobe presenting two rounded processes, one a little each side of the median line.

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[1] δῆλος clear, distinct.

The peristomium forms ventrally a conspicuous lower lip, which is proportionately broad. The lip presents anteriorly a wider median and, on each side, a short convex margin, and the border flares ventrad. The tentacles are short, in the preserved specimen somewhat enlarged distally and wholly smooth. They are few in number.

The branchiae are relatively thick at base, terete, and conspicuously subulate distad. In length they exceed twice the width of the body and equal nearly half the length.

The anterior setigerous somites, especially the first three or four, are proportionately very short. The somites of the caudal division are actually and proportionately longer, excepting the last ones. The setigerous notopodia are cylindrical. The non-setigerous notopodia of the caudal region are throughout well developed and of similar form, but less stout. The pinnulae expand above base, extending freely out into ectal and mesal angles distally, subtruncate, roughly inversely subtriangular in outline.

The capillary setae in type are somewhat longest over middle thoracic region, where they measure about 1.1 mm. Slenderly acuminate, as usual, the tips very slender, curved, but not at all uncinate or curled. The uncini present four fully developed teeth above the inferior process, as in *Grubiella antarctica* McIntosh, but with the abdental angle much less produced and the teeth of different form and proportions. (Plate 77, fig. 13).

Locality. Gulf of California: Sta. 3435 (lat. 26° 48′ N., long. 110° 45′ 20″ W.). Depth 859 fms. Bottom temp. 37.3° F. 22 April, 1891. One specimen.

This species is readily distinguishable from *S. anops* and *S. auricula* (Malmgren), recorded from Puget Sound and Japan respectively, in the form of the uncini and the number of their teeth, there being but four on each in place of six in *anops* and five in *auricula*. The branchiae are proportionately considerably longer than in *anops*, in which, in turn, they are longer than in *auricula*.

Pabits, gen. nov.[1]

Total number of somites uncertain. Fifteen somites bearing capillary setae. Uncini beginning on the fourth setigerous somite.

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[1] Gosiute pa, water, aquatic, and bitsi, bits, living thing, animal.

Tentacular region greatly elongated into a muscular cylindrical body, or proboscis, at the distal end of which the mouth opens, the elongate body bearing a ring of tentacles distally as well as numerous filiform tentacles over remaining part of surface.

No paleae present.

Three pairs of thick, distally pointed, branchiae.

Parapodia of thoracic region each consisting of a long setigerous notopodium and, excepting the first three pairs, of a short, compressed uncinigerous torus, or neuropodium. Abdominal parapodia consisting of an uncinigerous torus, with, above this, a small glabrous notopodial process and a short tubercle, or cirrus.

Notopodial setae with tips entire, slenderly acute; shaft narrowly bilimbate. Uncini pectinate along the free edge as in related genera, the teeth in transverse rows.

GENOTYPE.— *Pabits deroderus*, sp. nov.

Characterized by the greatly prolonged tentacular region and the presence of fifteen setigerous somites.

PABITS DERODERUS, sp. nov.[1]

Plate **77**, fig. 5, 6.

The body is yellowish.

The thorax narrows gradually from the anterior end to the abdomen; it is evenly convex above, and ventrally below the level of the uncinigerous tori is flattened. Only the anterior end of the abdomen is present. The length from the caudal end of the thorax to the anterior end of the body is about 21 mm., of which the region in front of the first setigerous somite composes nearly 8 mm. The greatest width of the thorax is 3.2 mm.

At the anterior end of the tentaculiferous region there is the transversely elongate mouth, bordering which above and below is a thick transverse ridge or fold, the distal and inner surfaces of which are minutely papillose and the ectal one more coarsely tubercular. At the ends of the mouth, between the ends of these folds and proximally continuous with them, is a smaller lobe or large papilla.

The cylindrical tentaculiferous region, or probosciform organ, is 6 mm. long, with a diameter at the distal end of 3 mm., the diameter proximally being a little less than this. At the distal end it is completely encircled by a crowded series of elevated tubercles with scarred distal ends which are apparently the bases of lost tentacles. The entire surface between this ring and the proximal end is covered with numerous, but well-separated, scars representing places of attachment of tentacles that have been lost, together with some long, cylindrical, or filamentous, tentacles still in place. On the dorsal side just back of the tentaculiferous region there is an elevated transverse fold which is divided by a transverse furrow, and the anterior margin of which is semicircular; on the middle part of this fold is a more elevated, transversely oblong, area which in front is bicornuate, the two thick processes anteriorly rounded, extending forward across the first division of the lobe. Caudad of this lobe, extending between its caudal ends, is a straight, transverse, thick fold, which is longer across its ends than mesally, and the surface of which is essentially smooth like that of the first ridge. Behind these ridges are two very short, achaetous, complete rings. The ventral region of the first of these is thickened and conspicuously elevated beyond the level of the second one; it projects forward so that its length is more than twice that of the second ring.

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[1] δηρὸς long, and δέρη, neck.

The succeeding rings to the end of the thorax are setigerous. Of these the first three are very short both above and below. The fourth is very short ventrally, but dorsally is much longer than the preceding ones. The following somites are not separated above by distinct intersegmental sulci, but ventrally the sulci are distinct and the somites long. Each has a broadly elevated, whitish, anterior region, which may be obscurely divided by a weak transverse furrow and a depressed posterior region. Each is crossed by the distinct neural furrow, which is particularly deep on the posterior part of the somite.

The branchiae are present on the first three setigerous somites, a pair on each; on each side they arise just above the notopodia. They are very thick, smooth filaments, pointed at the distal end.

The first four pairs of notopodia are much smaller than the others, the first being smallest of all and appearing as mere tubercles, with setae correspondingly short. The other neuropodia are moderately stout, cylindrical and long, the length equalling or somewhat exceeding that of the somite ventrally. Distally they are narrowed subconically, and the tip is somewhat compressed in the subanterocaudal direction. On the ventral side, at the distal end near the end of the series of setae, is a slight conical tubercle. The uncinigerous tori begin on the fifth setigerous somite. Each torus is a flattened structure with the distal end, along which the uncini are arranged, straight; constricted at the base so that the ends project freely; the lobe projects directly caudad from the elevated region of the somite.

The notopodial setae are numerous, long, finely pointed, and with the tips often curved; distally each is bilimbate; the shaft is densely fibrillate. The uncini are small and short; on the convex side, or base, there is a low, obtuse, angular projection which may show a narrow tubercle or point. On the opposite side there is a smooth, narrowly rounded lobe at one end, the rest of the edge being occupied by four or five series of teeth. The teeth decrease in size from the inferior process, three at the apex, when detectable, being minute. The formula is often 3+2+2+3+2 (1).

Locality. Toward the Marquesas: Sta. 3684 (lat. 0 50° S., long. 137° 54′ W.). Depth 2,463 fms. Bottom of greyish yellow Globigerina ooze. 10 September, 1899. One specimen.

Paiwa, gen. nov.[1]

Total number of somites about forty, of which eighteen bear capillary setae, these beginning with the second somite. Uncini beginning on the sixth somite.

Tentacles numerous, slender, cylindrical.

No paleae present.

Four pairs of subulate branchiae.

Parapodia of abdominal region each presenting a ventral uncinigerous torus, a short notopodium, and a long cirrus.

Notopodial setae capillary, slenderly pointed, narrowly bilimbate. Uncini with base long; pectinate along free edge as in related genera.

Genotype.— *Paiwa abyssi*, sp. nov.

Differing from Samytha Malmgren and allied genera which lack paleae in having eighteen setigerous somites and four pairs of branchiae.

Paiwa abyssi, sp. nov.[2]

Plate **76**, fig. 7–9; Plate **77**, fig. 9, 10.

Thorax of nearly uniform width except at caudal end, where it narrows to the width of the slender abdomen or, in some, more gradually narrowing from the anterior end. The abdomen narrows continuously from the anterior end caudad, but widens slightly at the very end. The dorsum is strongly convex, the venter flattened. The total length of the type is 43 mm., of which the abdomen composes about 24 mm. The greatest width of the thorax is 4 mm.; the width of the abdomen at its base, 2 mm., and at its narrowest point, which is about 2 mm. from the end, 1 + mm. The total number of somites is forty.

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[1] Gosiute paiwa, a mythical aquatic creature.

[2] abyssus, depth.

The body is somewhat brownish yellow throughout. The glandular ventral ridge between each two parapodia of the same pair is whitish.

Prostomium with anterior region strongly depressed, leaving an elevated transverse region behind, from the median part of which extends cephalad a lobe presenting two short, cylindrical, distally rounded processes, which are separated by about half their diameter and which project directly forwards and are essentially parallel. (Plate 76, fig. 7).

The peristomium forms ventrally a conspicuous lower lip, of which the anterior and lateral margins form a subsemicircular outline, or the anterior margin may be mesally more or less indented; lying in a dark, transverse band is a transverse sulcus from which two short, submedian sulci extend forwards to the anterior edge. The anterior border is paler. (Plate 76, fig. 7). The tentacles are moderate, cylindrical, and somewhat expanded at the tips.

The branchiae are more or less flattened, narrowed over the distal portion to a slender, apical portion, and commonly present a subulate tip. They are less than twice the width of the body. (Plate 76, fig. 8).

Segments II to IV are prominent ventrally, flaring below the general level of the thorax. Of these the first is ventrally longer than the second, and the second than the third, which is of same length as the fourth. Dorsally somite II is also longer and presents each side of the middle a short, angular process, or tubercle. From the fourth somite caudad the somites increase conspicuously in length. The length of the seventeenth somite on the ventral side in the type is 2.2 mm. The abdominal somites decrease in diameter regularly caudad. The pygidium flares a little about the anus in a weak trumpet-form, the inner surface being radially ridged.

The first notopodium on each side is a low, rounded tubercle from which the setae project almost directly cephalad. From the second one the notopodia increase in length to the middle thoracic region, where they are long and subcylindrical, in the type being here about 1.3 mm. in length. Beneath the distal end of each one a cirrus is represented by a small, conical tubercle. (Plate 77, fig. 9). The setae of the first segment are fewer and much shorter, those of the second intermediate.

The uncinigerous tori begin on the fifth setigerous somite. Both ends of the tori project freely over the base. The anterior tori are longest, the others decreasing rapidly caudad. The uncini are in a single series. The abdominal tori are very short, flattened, the ends projecting beyond the base, but not angular. Above is a short, cylindrical notopodial process, and between this and the torus a very long and slender cirrus. (Plate 76, fig. 9).

The uncini in profile view present the general appearance usual in related genera. Above the short, rounded, inferior process is a dwarf, erect tooth, and above this four larger, uncinate teeth which decrease in size toward the crest. In frontal view it is seen that there is at the apex a transverse series of three teeth, below this a second series of three, then one of two, while the lowermost tooth is single. The usual formula, beginning with the reduced lower tooth, is thus 1 + 1 + 2 + 3 + 3. (Plate 77, fig. 10).

The setae of the type, at their maximum, extend about 2.1 mm. distad of their tubercles. They are very dilute yellow in color. Distally they gradually narrow to long, slender tips, and are narrowly bilimbate and strongly fibrillate.

The tubes as preserved are from 150 to 200 mm. long and have a diameter in the middle region of about 7 mm. They are composed of fine greyish black mud, in which are to be detected the shells and shell-fragments of Globigerinae, Radiolaria, and the frustules of diatoms.

Locality. Between the Galapagos Islands and Peru: Sta. 4649 (lat. 5° 17′ S., long. 85° 20′ W.). Depth 2,235 fms. 10 November, 1904. Numerous specimens in their tubes.

Gen. et sp.?

An ampharetid dredged off Panama (Sta. 3395) at a depth of 730 fms. on 11 March, 1891, is too defective and badly preserved for identification.

Amphictenidae.

These are small or medium sized polychaetes in which the body is divided into two unequal and sharply distinct regions, the thorax and the abdomen, or scape, the latter very short, being composed of but five or six achaetous somites. The abdomen is convex beneath, but is dorsally fluted, or furrowed, and bears at the caudal end a short, thread-like process, or cirrus. The thorax is thick and subcylindrical. Somites not distinctly separated excepting about the first six, which are separated on the ventral side by intersegmental furrows.

The prostomium is obliquely truncate. Above it bears on each side a transverse series of stout, golden yellow spines, or paleae. At the caudal border of the prostomium above is a marginal raised ridge, which is entire, or sometimes crenulate. Below the paleae a very characteristic, transversely placed, membrane or velum, the margin of which is commonly frayed or incised into cirriform processes, more rarely entire, this cephalic membrane, or limbus, overhanging the mouth. At each side of the mouth a group of numerous filiform tentacles which are not retractile within the mouth.

On each side of the head two filiform tentacular cirri, one of which arises near the ectal end of the series of paleae, the other inserted on the succeeding somite; or these perhaps sometimes absent (Scalis).

There are two pairs of branchiae, two inserted on each side on what appear as the third and fourth obvious somites, or three pairs may be present. These branchiae are lamellar, with anterior border finely and densely pectinate.

Ventral glands weakly developed, limited to the first few somites.

Aside from the paleae there are two kinds of setae, the capillary notopodials and the unciniform neuropodials. The capillary setae form fifteen, seventeen, or eighteen pairs of fasciae; they are limbate and curved, part of them showing a finely serrulate border toward the distal end. The neuropodial setae are acicular crochets, the free distal margin pectinate, with often part of the teeth much smaller than the others, and the base prolonged into a stalk, not squat plates such as occur in the ampharetids; they begin ordinarily on the third or fourth setigerous somite.

Nephridia apparently variable in number from species to species.

Alimentary tract showing no such straight, wide stomach as occurs in the Ampharetidae, and never with anterior, or internal, caeca.

The ampharetids always inhabit tubes which they never normally leave and which they are unable to reconstruct when they have been removed. These tubes are somewhat conical in form and very regular, and are open at both ends. They are either straight or somewhat curved. The walls are composed of grains of sand, mud, fine shells, or even sponge spicules cemented together with mucus and lined with a thin membrane, and are of astonishing regularity. (*Cf.* Fauvel, Mem. Pontificia accad. Rom. Luicci, 1903, **21**, p. 7). The small end of the tube is normally uppermost, projecting above the surface of the sand, with the large end down. The animal's head is toward the large end, which is closed by the paleae fitting something like an operculum. The worms use the paleae for digging their way into the sand, and also as sieves for separating out the sand, enabling the animal to select food and suitable building materials. Waste material is ejected from the small end of the tube, and the peristaltic movements of the animal within the tube create a current necessary for respiration. Amphictenids are not, as sometimes stated, exclusively nocturnal in habits, but continue their digging operations in the daytime. They move about actively through the mud and sand. (Watson, Ann. mag. nat. hist., 1894, **14**, p. 43).

Key to Genera.

a. With two pairs of branchiae; fifteen or seventeen pairs of fasciae of capillary setae.
- *b.* The supraoral membrane, or velum, entire, not marginally laciniate; uncinigerous pinnulae beginning on the third setigerous somite, fourteen pairs........................*Petta* Malmgren.
- *bb.* The supraoral prostomial velum with border laciniate; pinnulae beginning on the fourth setigerous somite, twelve or thirteen pairs.
  - *c.* With but twelve pairs of pinnulae.
    - *d.* Fifteen pairs of fasciae of capillary setae, all about equally developed; uncini with 6–7 equal major teeth, the minor ones none, or inconspicuous....................*Lagis* Malmgren.
    - *dd.* Seventeen pairs of fasciae of capillary setae; uncini with three unequal major teeth, the minor teeth three or four, moderate or inconspicuous..........*Cistenides* Malmgren.
  - *cc.* With thirteen pairs of pinnulae.
    - *d.* Posterior dorsal margin, or ridge, of head entire; major teeth of uncini seven or eight; tube straight..*Pectinaria* Lamarck.
    - *dd.* Posterior dorsal marginal cephalic ridge serratodentate; major teeth of uncini six; tube moderately curved..*Amphictene* Savigny.

aa. With three pairs of branchiae; eighteen pairs of fasciae of capillary setae.........*Scalis* Grube.

Cistenides Malmgren.

Öfvers. K. vet. akad. Förh., 1865, **22**, p. 358.

Cistenides granulata (Linné).

Syst. nat. ed. 12, 1767, **1**, p. 1268; Malmgren, Öfvers. K. vet. akad. Förh., 1865, **22**, p. 359.
Amphitrite auricoma Fabricius, Fauna Groenlandica, 1780, p. 289.
Amphitrite escrichti Rathke, Nova acta Acad. Leop.-Car., 1843, **20**, p. 219.
Pectinaria groenlandica Grube, Fam. annel., 1851, p. 82, 138.

Locality. An incomplete specimen in bottle with two specimens of *Nereis pelagica* labeled simply Albatross, 1886. Probably from coast of southern New England.

Capitellidae.

These are worms in which the body is elongate, cylindrical, and composed of numerous somites. The body is divided into two regions more or less sharply marked off, a shorter anterior region, or thorax, consisting of from nine to fourteen somites, and a longer posterior region. The thorax has a cuticular mosaic, and its parapodia are rudimentary and bear capillary setae. The abdomen is armed with rows of crochets. The dividing plane between thorax and abdomen is at the point of transition between oesophagus and stomach. The color is yellow or brown, with the anterior region nearly always blood-red. Occasionally the posterior region is nearly transparent.

The prostomium is pointed, more or less conical, retractile. It lacks tentacles and palpi, but bears a pair of large retractile nut-formed ciliated organs. Eyes have the form of pigment specks.

The peristomium, or first somite, always lacks setae and appendages. Sometimes, however, it is fused with the prostomium (Capitella) and in such case the first distinct somite is setigerous.

The thorax as a whole is widest near the middle, thus more or less fusiform.

The parapodia are uniramous. Those of the thorax are slight prominences which lack all processes, and are retractile. Those of the abdomen are in the form of slightly retractile, not prominent, tori.

Branchiae are usually present in the posterior region at the ends of the rows of crochets. They are commonly markedly retractile, either completely so, in which case they are branched, or incompletely retractile and simple. They contain coelomic fluid, or haemolymph, and hence are red from the corpuscles in the latter.

On each somite there is a pair of prominences, the so-called lateral organs, covered with sensory hairs and regarded as auditory in function. Each is situated on the lateral line in a groove over the thorax, but is freely exposed on the abdomen. These lateral organs are lacking only in Capitella.

There are no blood-vessels, the blood being mixed with the lymph as haemolymph in the many branched coelom. The blood corpuscles are red; the plasma colorless.

The nephridia may occur in most somites of the body or may be confined to a restricted region.

The reproductive organs open through special pores, in the male showing a differentiation of vesiculae seminales and penes, and in the female of oviducts, receptaculae seminis and vulvae. In nearly all forms copulation occurs. Certain genera possess copulatory organs formed by specially modified, stout spines, or hooks, of certain parapodia, these being present in the male only, or in other cases in both sexes. Rarely there is no genital pore (Eisigella, Clistomastus).

Mouth ventral in position. Proboscis eversible, papillose but wholly unarmed, used in boring. Anus terminal, usually surrounded by a large rim bearing papillae. There is a straight oesophagus followed by a stomach, below which is the accessory gut ("nebendarm") opening into it at both ends and supposed to be respiratory in function.

With the exception of *Eisigella onanaryensis* all the known capitellids are marine. They occur in sand and mud, in the detritus of Algae, or in the fissures of rocks, for the most part in tubes which they construct. They live upon minute organisms, such as diatoms, foraminifers, and radiolarians, and upon the organic fragments occurring in the sand or mud in which they live.

Key to Genera.

a. Thorax with exclusively capillary setae.
- *b.* Abdomen with crochets exclusively.
  - *c.* Branchiae present.
    - *d.* With twelve thoracic somites; branchiae single filaments............ *Notomastus* Sars.
      - *e.* Genital ducts and pores absent or rudimentary.......... Subgen. *Clistomastus* Eisig.
      - *ee.* Genital ducts and pores well developed........................ *Notomastus* sens. str.
    - *dd.* Fourteen thoracic somites; branchiae of two or more tufted filaments. *Dasybranchus* Grube.
  - *cc.* Branchiae none.
    - *d.* Eleven setigerous thoracic somites, no macroscopic distinction otherwise between thorax and abdomen.. *Capitellethus*, nom. nov.
    - *dd.* Thorax of twelve or thirteen setigerous somites.
      - *e.* Twelve setigerous thoracic somites............................... *Eisigella* Gravier.
      - *ee.* Thirteen setigerous thoracic somites.
        - *f.* An anal funnel supported by acicula or spines; with two anal cirri. *Scyphoproctus* Gravier.
        - *ff.* With no spine-supported anal funnel.......................... *Leiochrides* Augener.
- *bb.* Abdomen with capillary setae in addition to the crochets.
  - *c.* No branchiae; first abdominal somite with capillary setae............... *Leiochrus* Ehlers.
  - *cc.* Branchiae present.
    - *d.* With twelve thoracic somites.................................... *Mastobranchus* Eisig.
    - *dd.* Eighteen (or seventeen) thoracic somites........................ *Eunotomastus* McIntosh.

aa. Thorax with crochets in addition to the capillary setae.
- *b.* With but nine or ten thoracic somites; no branchiae.
  - *c.* Nine distinct thoracic somites (morphologically ten, but the first fused with the prostomium); 1 to 6 with capillary setae, 8 and 9 crochets (and 7 often with both).
    - *d.* Special copulatory setae in the males only.......................... *Capitella* Blainville.
    - *dd.* Copulatory setae occurring in both sexes.
      - *e.* Copulatory apparatus alike in both sexes (one copulatory seta in each notopodium of eighth and ninth somites).. *Capitellides* Mesnil.
      - *ee.* Copulatory apparatus strongly differing in the two sexes (copulatory setae forming a single group on eighth and ninth somites in male, and in less developed form on seventh and eighth in female).................................. *Isomastus* Gravier.
  - *cc.* With ten thoracic somites (2 to 4 or 5 with capillary setae, and 5 or 6 to 10 with crochets). *Capitomastus* Eisig.
- *bb.* With twelve or more thoracic somites.
  - *c.* With twelve or thirteen thoracic somites; first three or four with capillary setae only.
    - *d.* Twelve thoracic somites.. *Heteromastus* Eisig.
    - *dd.* Thirteen thoracic somites.................................... *Heteromastides* Augener.
  - *cc.* Eighteen thoracic somites; first fourteen with capillary setae only.... *Pseudocapitella* Fauvel.

Synonymy of Genera.

Eisig in his monumental work on the Capitellidae (Monog. 16 Fauna flora Golfes Neapel, 1887, p. 810, 814) divided Notomastus into two subgenera to which he applied the names respectively of Clistomastus and Tremastomastus Eisig. However, since the second division contains *N. latericeus* Sars (*Capitella rubicunda* Keferstein and *Arenia cruenta* Quatrefages), the type of the genus, that division must be known as Notomastus *sens. str.* and Tremastomastus suppressed as its synonym.

Dasymallus was proposed as a genus by Grube in 1846; but as the name had previously been used in Coleoptera (1834) he replaced it with Dasybranchus (1851).

Ancistria Quatrefages (1865) is the same as Heteromastus Eisig (1887); but as Ancistria was earlier in use for a genus of Coleoptera (1845) Eisig's name must be used.

Valla Johnston is a synonym of Capitella Blainville.

Capitellides Ehlers (1907) is preoccupied by Capitellides Mesnil (1897) and is accordingly here replaced by Capitellethus, nom. nov.

NOTOMASTUS Sars.

Nyt. mag. naturw., 1851, **6**, p. 199; EISIG, Monog. 16 Fauna flora Golfe Neapel, 1887, p. 807.
Arenia QUATREFAGES, Hist. nat. annelés, 1865, **2**, p. 250.
Sandanis KINBERG, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 343.

NOTOMASTUS LATERICEUS Sars.

Nyt. mag. naturw., 1851, **6**, p. 199; EISIG, *Loc. cit.*, 1887, p. 861; MCINTOSH, British annelids, 1915, **3**, pt. 3, p. 276, pl. 92, fig. 1, pl. 98, fig. 19, pl. 107, fig. 9–9b.
Capitella rubricunda KEFERSTEIN, Zeitschr. wiss. zool., 1862, **12**, p. 123, pl. 11, fig. 7–18.
Arenia cruenta QUATREFAGES, Hist. nat. annelés, 1865, **2**, p. 250, pl. 11, fig. 16–23.
Sandanis rubricundus KINBERG, Öfvers. K. vet. akad. Förh., 1865, no. 4, p. 343.
Notomastus rubricundus EISIG, *Loc. cit.*, 1887, p. 863.
Notomastus ferbilis EISIG, *Loc. cit.*, 1887, p. 819, pl. 1, fig. 1.

LOCALITY. A fragment labeled ALBATROSS, 1886. Probably from New England.

SABELLIDAE.

In this family the body is divided into two distinct regions, an anterior, or thorax, most usually consisting of nine somites, in which the parapodia have the notopodial fascicles of capillary setae with uncinigerous tori ventrally, and an abdomen in which the relations of the setae are inverted, the capillary forms being ventral and the uncini dorsal. Rarely there are no crochets on the thoracic somites (Caobangeinae).

The prostomium proper is not distinct, being hidden by the peristomium, which is carried forward and usually shows a distinct collar. The prostomium bears two large lobes, commonly regarded as the greatly developed palpi, right and left respectively, which carry branchiae on which are barbules arranged in two series, the branchiae inserted in a circular arc, or in several turns of a spiral. The tentacles are very small, often showing only as slight, sensory tubercles. Eyes, often composite, may be present on the branchiae. No cirri are present. Hence, no thoracic membrane.

The capillary setae have various forms of much service in classification. The uncini are in form either avicular or pectinate, or in some cases with long manubria.

A median ciliated groove extending forward from the anus to the anterior end carries faecal matter out of the tube. Usually ventral in position, it often curves dorsad on the thorax.

There is no protrusible proboscis and no pharynx.

Ventral gland shields present on abdomen as well as on thorax.

The tube is formed of more or less transparent mucin of variable consistence, usually strengthened by mud, grains of sand, fragments of shells, or other adherent materials. The mud strengthening the tubes often has a tough consistence almost like that of caoutchouc. Some show a marked colonial tendency, the lower parts of their tubes, which lack the supporting wall of mud, being united together and attached to a common support. The tubes of the boring forms remain membranous.

The size of sabellids varies from a few millimeters only, on the one hand, to five hundred millimeters or more on the other, the number of somites varying correspondingly from near twenty to more than six hundred. These forms are often of different and brilliant colors, the expanded branchiae in particular showing a varied brilliance and beauty.

The sabellids nearly always remain within their tubes, though it has been shown that they may exceptionally leave them and swim about freely, as St. Joseph has demonstrated in the case of *Bispira elegans* (St. Joseph) and *Myxicola dinardensis* St. Joseph (Ann. sci. nat., 1894, ser. 5, **17**, p. 316, 324), and Gravier in that of a young *Laonome elegans* Gravier (Nouv. arch. Mus. hist. nat., 1908, ser. 4, **10**, 1908, p. 101). While living ordinarily in more or less shallow water, some forms have been found at depths of 600 and 700 fms, such as *Sabella assimilis* McIntosh and *Sabella pavonina* Savigny. While the great majority of sabellids are marine, at least four forms are at present known to occur in fresh or brackish water. *Manayunkia speciosa* Leidy has been found in the Schuylkill River at Philadelphia and in Egg Harbor River in New Jersey; and *Caobangia billeti* Giard, living in perforations in the shell of a large viviparous Melania, is common about Caobang, Tonkin (Giard, Compt. rend. Soc. biol., 1893, ser. 9, **5**, p. 473). And finally two species of Dybowscella, *baicalensis* Nusbaum and *godlewski* Nusbaum, which live in lake Baikal,[1] the fauna of which in so many other branches also strongly suggests its derivation from the sea.

Since the tubes of sabellids nearly always considerably exceed the dimensions of the contained animals, the unoccupied space is taken advantage of by various commensals and parasites. Such are various parasitic copepods; *e.g.*, *Sabelliphilus elongatus* Sars on *Sabella sarsi* Kr., *Chonephilus dispar* Sars on *Euchone papillosa* Sars, *Sabellachares gracilis* Sars on *Myxicola sarsi* Kr., *Gastrodelphys clausii* Graeffe on *Distylia volutacornis* Mont., and various others.[2]

Dybowscella shows a strongly marked sexual dimorphism. Certain sabellids are hermaphroditic, such as *Amphiglena mediterranea* Leydig. The sabellids have a pronounced power of regenerating lost parts, particularly noticeable in the case of the branchiae, which are frequently broken off. (*Cf.* Gravier, Nouv. arch. Mus. hist. nat., 1908, ser. 4, **10**, p. 298).

Key to Genera.

- I. Thoracic somites with uncinigerous neuropodial tori and notopodial capillary setae; alimentary tract well developed..*Sabellinae*, subfam. nov.
  - *a.* Thoracic neuropodial tori bearing two kinds of setae ordinarily arranged in two rows.
    - *b.* Thoracic tori bearing avicular crochets and pennoned setae.
      - *c.* With a distinct collar.
        - *d.* Basilar branchial lamina describing several turns of a spiral.
          - *e.* The two branchial lobes unequal; setae of thoracic notopodia of one kind. *Spirographis* Viviani.
          - *ee.* The two branchial lobes equal; dorsal thoracic setae of two kinds.
            - *f.* Branchial lobes spiral only in retraction; lower thoracic notopodial setae oblanceolate. *Metalaonome* Bush.
            - *ff.* Branchial lobes always forming a spiral.
              - *g.* Collar with ends separated above; lower thoracic notopodials lanceolate. *Distylia* Quatrefages.
              - *gg.* Collar with ends meeting above; lower thoracic notopodials spatulate. *Eudistylia* Bush.
        - *dd.* Basilar branchial lamina not describing several turns of a spiral.
          - *e.* Dorsal setae of thorax of one kind.
            - *f.* Collar with two lobes; eyes on branchiae subterminal......*Branchiomma* Kölliker.

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[1] Biol. centralbatt, 1901, **21**, p. 6; also Gravier, *Op. cit.*, p. 69.

[2] *Cf.* St. Joseph, Ann. sci. nat., 1894, ser. 5, **17**, p. 266, for original citations.

ff. Collar with four lobes; eyes not subterminal........................*Sabella* Linné.
ee. Dorsal setae of thorax of two kinds.
f. Abdominal setae of but one kind.
g. Collar two-lobed.
h. Collar with ends dorsally separated........................*Parasabella* Bush.
hh. Collar with ends in contact above........................*Potamilla* Malmgren.
gg. Collar four-lobed.
h. Branchiae simple....................................*Pseudopotamilla* Bush.
hh. Branchiae dichotomously divided from one to six times....*Schizobranchia* Bush.
ff. Abdominal setae of two kinds.
g. Setae of first somite in linear rows.
h. Collar one-lobed......................................*Protulides* Webster.
hh. Collar two-lobed......................................*Hypsicomus* Grube.
gg. Setae of first somite forming an ordinary small fascicle on each side; posterior base of avicular uncini very long....................*Potamethus*, nom. nov.
cc. Collar none or rudimentary.
Dorsal thoracic setae of one kind................................*Amphiglena* Claparède.
bb. Thoracic tori bearing avicular crochets forming a single row and long-stemmed rostrate crochets adjacent to these..*Laonomedes*, gen. nov.[1]
aa. Thoracic tori bearing a single row of setae, these being crochets of one kind,— pectinate, avicular or rostrate.
b. Crochets avicular both on thorax and on abdomen.
c. Branchiae with dorsal (outer) appendages; dorsal thoracic setae of a single kind.
d. Collar four-lobed..*Dasychone* Sars.
dd. Collar two-lobed...*Dasychonopsis* Bush.
cc. Branchiae without outer appendages.
d. Dorsal thoracic setae of two kinds.
e. Setae lacking on first somite.
f. Posterior base of uncini truncate; collar with ends separated....*Laonome* Malmgren.
ff. Posterior base of uncini prolonged; collar with ends in contact..*Paralaonome* Bush.
ee. Setae in a double angular series on first somite; posterior base of uncini ordinary. *Notaulax* Tauber.
dd. Dorsal thoracic setae of one kind.
e. Branchial lobes on each side forming a double concentric semicircle. *Sabellastarte* Savigny.
ee. Branchial lobes not thus arranged.
f. Collar well developed; branchiae united by a membrane..........*Eurato* St. Joseph.
ff. Collar obsolete; branchiae free...............................*Euratella*, gen. nov.[2]
bb. Crochets of thorax with long manubria.
c. Crochets of abdomen with long manubria; dorsal thoracic setae of one kind (an inner pair of longer tentacles; abdominal somites only three).
d. Branchial lobes laterally elongate, bearing numerous ciliated branchiae and seven eye spots on each side; seventh somite specially modified, longer than the others and anteriorly expanded..*Manayunkia* Leidy.
dd. Branchial lobes not thus extended laterad, eye spots one or none on each side; seventh somite not specially modified.
e. Branchial lobes small, bearing few ciliated branchiae; one distinct eye spot on each lobe in both sexes..*Haplobranchus* Bourne.
ee. Branchiae numerous; eye spots none in male, a rudimentary pigment spot on each brain lobe in female...*Dybowscella* Nusbaum.
cc. Crochets of abdomen not with long manubria, pectinate or avicular uncini recalling often those of Serpulidae and Terĕbellidae.
d. Branchiae united by a slight membrane over most of length.
e. Without protruding uncinigerous tori.
An almost complete girdle of very small uncini on abdomen. Dorsal thoracic setae of one kind...*Myxicola* Koch.

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[1] Genotype.— *Laonome antarctica* (Kinberg).
[2] Genotype.— *Laonome salmicidis* (Claparède).

ee. With protruding uncinigerous tori; uncini not forming a girdle on abdomen.

f. A ventral groove on the posterior somites........................*Euchone* Malmgren.

ff. No ventral groove on posterior somites.

g. Inferior thoracic notopodial setae lanceolate................*Megachone* Johnson.

gg. Inferior thoracic setae clavate or spatulate, distally broad.

h. Inferior thoracic setae with an acute tip...................*Chone* Malmgren.

hh. Inferior thoracic setae distally rounded, wth no acute tip or mucro. *Metachone* Bush.

dd. Branchiae free, not united over most of length by a weak membrane.

e. Dorsal thoracic setae of two kinds.

f. Abdominal uncini pectinate.............................*Dialychone* Claparède.

ff. Abdominal uncini avicular.................................*Bispira* Claparède.

ee. Dorsal thoracic setae of one kind.

f. Thoracic somites five.

Collar none or rudimentary; abdominal uncini few, pectinate. *Oriopsis* Caullery and Mesnil.

ff. Thoracic somites normally at least eight.

g. With a collar..*Oriades*, nom. nov.

gg. Collar lacking..*Fabricia* Blainville.

II. First seven or eight somites (thoracic) with notopodial capillary setae only (or rudimentary crochets on the first) no alimentary tract in adults.

Crochets of avicular type on three, or rarely four, somites beginning on eighth or ninth somite in dorsal position, on these and following somites capillary neuropodial setae. *Caobangiiniae*, subfam. nov.

Caobangia Giard.

The general features of the grouping indicated in this key were established by Langerhans (Zeits. wiss. zool., 1880, **34**, p. 111). The principles of the classification have in the main proved satisfactory and have been developed particularly by the excellent work of St. Joseph (Ann. sci. nat., 1894, ser. 5, **17**, p. 246 *et seq.*), whose system in its essentials is here adopted. I have endeavored so far as possible to include in the key all genera that have been proposed, although recognizing the slight basis upon which several of them appear to rest. It has not been possible to include Demonax Kinberg, which is not described in sufficient detail in the original account and of which species have not been recognized by subsequent workers. The same is true of that author's Parachonia, which may prove to be identical with some other known genus having thoracic setae of two types; but as the uncini are not described as to form or arrangement identification seems impossible at present. Anamöbaea Kröyer has also not been identified and is not included. Its type, *A. oerstedi*, a West Indian species, has a rudimentary collar and two types of thoracic notopodial setae, with branchiae united.

Synonymy of Genera.

I have felt much hesitation in deciding on the proper application of the generic name Bispira. It was proposed first by Kröyer in 1856 (K. Danske vidensk. selsk. Forhand., 1856, p. 13); but that author brings no species definitely into connection with his brief diagnosis of a single clause, saying merely that for "de Sabeller, hos hvilke begge Gjaellebuskene danne Spiraler, må udjøre en sjaette Slaegt, hvilken man måske kunde kalde Bispira." In 1870, Claparède (Annélides Chétop. Golfe Naples. Suppl., 1870, p. 429) mentions the genus in comments on *Bispira volutacornis* Rathke as a representative. Any slight evidence available in Kröyer's paper would indicate that this species is the one which he had in mind. At any rate, it is fixed by Claparède's use as the type. This species was renamed *rubripunctata* by Grube who showed that Rathke's species is not identical with the *Amphitrite volutacornis* Montagu, type of Quatrefages's Distylia. Furthermore, St. Joseph (*Op. cit.*, p. 285) points out that Rathke's species (*rubripunctata* Grube) belongs in Jasmineira Langerhans (1880), though that author retains Bispira Kröyer in the sense of Distylia. It seems impossible to justify this procedure. Here Bispira is accepted as established by Claparède's use of it in 1870 and as replacing Jasmineira. Distylia Quatrefages is used in the sense given to Bispira by St. Joseph.

St. Joseph (*Op. cit.*, p. 250) merges Manayunkia Leidy with Haplobranchus Bourne (1883), giving the latter precedence; but Leidy's first account was published in 1858 (Proc. Acad. nat. sci. Philad., 1858, p. 90; 1859, p. 2), his paper of 1883 (*Ibid.*, 1883, p. 204, pl. 9) being merely an extension of the earlier one, so that in such case Manayunkia must be used. Dybowscella Nusbaum is also exceedingly close to these forms.

Aspeira Bush is included in Potamilla Malmgren. Metachone Bush is left apart tentatively, but is likely to be found inseparable from Chone Malmgren.

The following are synonyms of Myxicola Koch: Eriographis Koch, Arripasa Johnston (the type of which, *Amphitrite infundibulum* Montagu, is also the type of Myxicola) and Leptochone Claparède. This genus has sometimes been included in a special family, the Eriographidae (Eriographides Malmgren).

Amphicora Ehrenberg and Othonia Johnston are synonyms of Fabricia Blainville.

Grube suggests that Rathke's species *stigmatosa*, for which he proposed the genus Clymeneis, is a Sabella that has lost its branchiae.

Potamis Ehlers, preoccupied in Lepidoptera (Hübner, 1816), is replaced by Potamethus, nom. nov.

Oria Quatrefages (1865), being preoccupied (Hübner, Lep. 1816, Desv., Diptera 1863), is here replaced by Oriades, nom. nov.

DASYCHONOPSIS Bush.

Harriman, Alaska Exped., 1910, **12**, p. 191, 198.
Dasychone Auct. (ex part.).

DASYCHONOPSIS NIGROMACULATA (Baird).

Sabella nigromaculata Baird, Journ. Linn. soc. London, 1865, **8**, p. 159, pl. 5, fig. 5, 6.
Dasychone nigromaculata McIntosh, Challenger annelids, 1885, p. 503, pl. 53, fig. 5, pl. 31A, fig. 4–6; pl. 39A, fig. 6.

A single specimen taken on Abrolhos Island, off Brazil, 28 December, 1887. It is about 44 mm. long, inclusive of branchiae, and 34 mm. without; width across abdomen, 6.5 mm. There are but thirty-seven branchiae on each side in place of forty-two or forty-three given by McIntosh for his specimen from St. Thomas. The setae and uncini agree essentially in form. The species is also known from St. Vincent.

SERPULIDAE.

In their general structural characteristics these polychaetes are very similar to the Sabellidae, with which they are by some united into a single family. They never attain the size of the larger sabellids, rarely exceeding ten or twelve centimeters in length. While their coloration is not so conspicuously displayed as among the sabellids, it is often varied and attractive, varying much even with the same species.

In contrast with the preceding family an operculum is in most cases present, this being formed by the dilatation of one or more of the branchial filaments, which may be altered as a whole or which may retain the normal structure below the operculum proper. The operculum may be simply membranous, may be of horny consistence, or may possess a calcareous plate. Plates and processes of a great variety of form may be developed on the operculum. The position and number of opercula are subject to considerable variation in certain species.

A thoracic membrane, representing the fused cirri, is nearly always present.

The general arrangement of the parapodia and the forms of setae and uncini is, in general, as in the preceding family.

Ventral glands confined to the thorax.

There is no definite ciliated groove, though the ventral surface, and sometimes the dorsal, may be in part ciliated.

In this family the tube is formed of mucin impregnated with calcareous matter and is usually open at but one end, which is typically closed by the operculum. These tubes are ordinarily fixed to solid objects, such as rocks and shells. They take the most varied configurations, occasionally straight to sigmoidally curved or irregularly sinuous and loosely coiled, and the forms in which coiled into a nautiloid spire either over the entire length or only over the posterior portion. While the inner surface, or bore, is smooth and uniform, the outer surface may be very uneven from supporting processes in the form of spines or keels. The tubes are often single but they may be aggregated into polypiform groups, as is normal in the genera Filograna and Salmacina and as occurs in *Serpula vermicularis* Linné and *Pomotoceros triqueter* Linné. Some forms have their tubes entirely free. As with the sabellids, there is some evidence that the serpulids may occasionally leave their tubes entirely.

Both sabellids and serpulids occur for the most part in water of small depths; but exceptionally a species is taken in very deep water, such being *Placostegus benthalianus* McIntosh, which was dredged by the CHALLENGER at 3,125 fms.

Some species are hermaphroditic; and *Salmacina dysteri* Huxley is not only hermaphroditic but also viviparous (Edinb. new philos. journ., 1855, new ser., 1, p. 113, fig. 1–11). It has also more recently been demonstrated that a sexual multiplication by budding and fission occurs in the group (Malaquin, Compt. rendus Acad. sci., 1905).

Key to Genera.

a. Uncini with teeth exceedingly fine and numerous, the series terminated at the cephalic end by a proportionately long, entire spine; plate emarginate deeply at the posterior end beneath.
  b. No operculum; thoracic setae all of the ordinary limbate type.
    c. Branchial lobes not spiral.
      d. No thoracic membrane .... *Salmacinopsis* Bush.
      dd. A thoracic membrane present.
        e. Collar three-lobed; branchiae in a semicircle .... *Subprotula* Bush.
        ee. Collar entire; branchiae in a circle .... *Psygmobranchus* Philippi.
    cc. Branchial lobes spiral.
      d. Abdominal setae falcate .... *Protula* Risso.
      dd. Abdominal setae obliquely bayonet-formed, border plaited .... *Protulopsis* St. Joseph.
  bb. With a globular or ampulliform operculum; thoracic setae not all of the ordinary limbate type.
    c. Setae of first thoracic somite like those of the succeeding thoracic somites, partly simply limbate and partly terminating in a falcate blade, below which is a short limbus.
      d. Abdominal setae falcate .... *Apomatus* Mörch.
      dd. Abdominal setae geniculate .... *Apomatopsis* St. Joseph.
    cc. Setae of first somite in part simple and non-limbate and in part having a crenulate limbus or wing; setae of all other thoracic somites non-limbate, curved, with denticulations on the convex side .... *Cystopomatus* Gravier.
aa. Uncini not of this form.

b. Uncini subrectangular, usually not emarginate or but moderately so; free border thick, crossed by numerous fine ridges at right angles to the margin; teeth exceedingly fine and appressed, discernible only with difficulty, with at the anterior or lower end of the series a prolongation or spine excavated below, gouge-like.

Setae of first somite replaced by a girdle of eyes; setae of the other thoracic somites limbate.

Operculum ending in a flat plate. Tubes crystalline.

c. Abdominal setae weakly geniculate, limbate.................... *Placostegopsis* St. Joseph.

cc. Abdominal setae not of this form.

d. Abdominal setae compressed cornuform, extended at one side into a long fine tip; thoracic membrane extending full length of thorax........................ *Placostegus* Philippi.

dd. Abdominal setae all fine, capillary, not limbate; thoracic membrane terminating with first somite... *Bonhourella* Gravier.

bb. Uncini with free border not thus finely ridged, the margin bearing less numerous teeth that are distinct and not compressed.

c. Uncini ordinarily tetragonal or trapeziform, with teeth comparatively numerous and fine, the series terminating anteriorly, or below, in a large process or spine, which is nearly always distinctly excavated in gouge-like manner. Abdominal setae compressed cornuform, with long tip.

d. Setae present on the first somite.

e. Dorsal setae of all thoracic somites alike, limbate, simply tapered.

f. Operculum preceded by two membranous wings and terminating in a flat or conical plate bearing one or more (commonly three) processes or spines. . . *Pomatoceros* Philippi.

ff. Operculum infundibuliform, bearing no spines.................. *Spirodiscus* Fauvel.

ee. Dorsal setae of the first somite of two distinct kinds; the setae of the other thoracic somites limbate and simply tapering.

f. Operculum ending in a plate covered with a cluster of branching spines or bearing five or six dichotomously divided laminae.

g. Operculum with a cluster of spines; special setae of first somite geniculate, with numerous small spines at base of blade........................ *Spirobranchus* Blainville.

gg. Operculum bearing five or six dichotomously divided plates; special setae of first somite not geniculate, limbus broad, indented below tip, with no spines at base of blade.. *Pomatoceropsis* Gravier.

ff. Operculum bearing an axis to which are joined, often in the form of a pyramid, several separate plates.. *Pomatostegus* Schmarda.

dd. No setae on the first thoracic somite.

All thoracic setae simply limbate; operculum flat, with peduncle winged. *Pomatoleios* Pixell.

cc. Uncini with teeth fewer and less fine, the series terminating anteriorly in a tooth longer and more obtuse than the others, this not excavated.

Abdominal setae geniculate, falcate, spiniform, or simply limbate, but never compressed cornuform.

d. With special setae on the first somite.

e. Abdominal setae geniculate or falcate.

f. Tube small, calcareous, in a dextral or sinistral nautiloid spiral, or rarely in an ascending spire.

Setigerous thoracic somites mostly three, sometimes three and a half or four, a long naked region between thorax and setigerous part of abdomen; operculum with calcareous plate.. *Spirorbinae*, subfam. nov.

g. Collar setae all or in part with posterior notch and fin.

h. All collar setae with notch and pronounced fin.

i. Tube sinistral.

j. With four thoracic somites......................... *Protolaeospira* Pixell.

jj. With three and a half or four thoracic somites.

k. Three and a half thoracic somites. . . . *Paralaeospira* Caullery and Mesnil.

kk. With three thoracic somites.......................... *Spirorbis* Daudin.

l. Incubation in the tube..................... subgen. *Spirorbis* sens. str.

ll. Incubation in the operculum.............. subgen. *Pileolaria* Claparède.

ii. Tube dextral.

j. With three and a half thoracic somites............... *Spirorbides*, gen. nov.

jj. With three thoracic somites......................... *Spirorbella*, gen. nov.

hh. Collar setae in part simple blades and in part with a shallow posterior notch.

i. Tube sinistral..*Sinistrella*, gen. nov.

ii. Tube dextral..*Janua* St. Joseph.

gg. Collar setae all simple blades.

h. Tube sinistral; three thoracic somites......................*Leodora* St. Joseph.

i. Incubation in the operculum......................subgen. *Leodora sens. str.*

ii. Incubation in the tube..............subgen. *Romanchella* Caullery and Mesnil.

hh. Tube dextral.

i. With three and a half thoracic somites....*Paradexiospira* Caullery and Mesnil.

ii. With three thoracic somites.

j. Blades of collar setae geniculate; incubation in the tube.*Circeis* St. Joseph.

jj. Collar setae not geniculate, evenly curving; incubation in the operculum. *Dexiospira* Caullery and Mesnil.

k. Collar setae broadly rounded at base................*Dexiorbis*, subgen. nov.

kk. Collar setae with blade regularly tapered..............*Dexiospira sens. str.*

ff. Not with these characters, the tubes not in such spirals, though often sinuous and variously curved, and in some normally aggregated in polypiform groups.

g. Setae of the first thoracic somite with a posterior notch and a crenulate wing.

h. Falcate setae with blades not preceded by a limbus on one or more thoracic somites.

i. No thoracic membrane..............................*Chitinopoma* Levinsen.

ii. A thoracic membrane present.

j. Tubes very fine, nearly always aggregated in polyp-like groups.

k. With a spoon-shaped operculum placed obliquely at the end of a branchia. *Filograna* Oken.

kk. With no operculum..............................*Salmacina* Claparède.

jj. Tube ordinary.

Operculum infundibuliform, resting on an ampulla, with the peduncle bearing barbules...*Filogranula* Lang.

hh. Other thoracic somites not with such falcate setae lacking laminae.

i. These setae with limbus followed by a falciform tip on one or more somites.

Erect part of tube forming a right angle with fixed part; operculum ampulliform, followed by a concave plate from which proceeds a small point. *Omphalopoma* Mörch.

gg. Setae of first thoracic somite without posterior notch or crenulate wing.

h. Setae of first thoracic somite geniculate.

Setae of other somites with blade followed by a falciform tip (Apomatus form); branchiae rather numerous; tube ordinary; operculum a round ampulla with terminal concave plate.......................*Omphalopomopsis* St. Joseph.

hh. Setae of first thoracic somite acicular.

Setae of other thoracic somites of Apomatus form; tube ordinary; operculum with triangular ampulla surmounted by a piece in the form of an hour-glass. *Janita* St. Joseph.

ee. Abdominal setae not geniculate, capillary on all somites.

f. Setae of first thoracic somite with notch and crenulate wing; setae of other thoracic somites laminate only; operculum membranous, vesicular. .*Hyalopomatopsis* St. Joseph.

dd. With no special setae on first somite or collar, or setae missing from this somite altogether.

e. No setae on the first somite..*Rhodopsis* Bush.

ee. Collar setae present.

f. Abdominal setae geniculate and dentulate.

g. Thoracic setae limbate only.

h. Operculum covered with pieces bearing a large number of spines. *Galeolaria* Lamarck.

hh. Operculum cylindrical, borne on an ampulla, with one to several transverse furrows. *Vermilia* Lamarck.

gg. Thoracic setae of Apomatus as well as the limbate form.

Operculum on an ampulla, with a horny cap which may be curved or somewhat spiral...*Vermiliopsis* St. Joseph.

ff. Abdominal setae not geniculate; thoracic setae all limbate.

g. Abdominal setae capillary on all somites.

h. With a thoracic membrane.

- *i.* Branchiae without dorsal appendages; tube free, open at both ends; operculum conic, terminated by a flat plate covered with concentric striae. *Ditrupa* Berkeley.
- *ii.* Branchiae with dorsal appendages; tube fixed; operculum glandiform. *Dasynema* St. Joseph.

hh. No thoracic membrane; operculum membranous and vesicular. *Hyalopomatus* Marenzeller.

gg. Abdominal setae in the form of stout, moderately curving, aciculiform spines on all but the posterior somites, where they are replaced by very long, fine capillary setae which are straight.

Operculum obconic, without processes....................... *Paumotella*, gen. nov.

cc. Uncini with teeth fewer and coarser, the series terminating anteriorly, or below, in a tooth larger than the others but similarly pointed.

d. No operculum.

Setae of the first thoracic somite geniculate and with tip preceded by a posterior notch and crenulate wing; abdominal setae capillary......................... *Protis* Ehlers.

dd. With an operculum.

e. Operculum formed by the transformation of only the tip of one or more branchiae.

f. Collar setae geniculate; operculum with a horny plate...... *Protoplacostegus* Bush.

ff. Collar setae not geniculate; operculum with a calcareous plate. *Josephella* Caullery and Mesnil.

ee. Operculum formed by the transformation of one or more entire branchiae.

f. Operculum without radii.

g. Operculum forming two deep funnels one above the other, with the edge subdivided into branched processes................................ *Schizocraspedon* Bush.

dd. Operculum forming a deep funnel with edge incised and each process terminating in a knob; a long curved process arising from the center of the funnel............ *Glossopsis* Bush.

ff. Operculum with radii.

g. Peduncle of operculum bearing four digitiform processes in the form of a cross. Operculum infundibuliform, crenulate, rays ending in conic teeth. *Crucigera* Benedict.

gg. Peduncle of operculum not bearing such processes.

h. Operculum at middle with a crown of spines or rods.

- *i.* Spines of crown simple and regularly tapered, without lateral processes. *Eupomatus* Philippi.
- *ii.* Spines of crown with lateral processes.
  - *j.* Spines pointed.. *Hydroides* Gunnerus.
  - *jj.* Spines blunt, each with a single lateral process on each side. . *Eucarphus* Mörch.

hh. Operculum with no such crown of spines.

- *i.* Radii of operculum numerous, margin serrate................ *Serpula* Linné.
- *ii.* Radii of operculum few, margin crenate..................... *Sclerostyla* Mörch.

Because of a marked variability in many of the more obvious characters of this family their classification is attended with many difficulties through which no royal road has been discovered. The most definite and least variable characters are those afforded by the setae, the study of which along lines indicated by the work and experience of Claparède, Langerhans, Marenzeller, and St. Joseph seems to yield the only satisfactory basis for a classification giving promise of preciseness and naturalness. Any arrangement made at present must be incomplete, and in considerable measure tentative, because of numerous gaps in our knowledge even of the known forms. The account of the setae, and particularly of the uncini, where not omitted altogether, is in many descriptions wholly inadequate. In the analysis of genera given in the preceding table the general lines indicated by St. Joseph (Ann. sci. nat., 1894, **17**, p. 259 ff.) have been adopted where practicable as a basis. No effort at general revision is made, the intent being to take up all proposed genera so far as possible where sufficiently tangible characters are available.

Synonymy of Genera.

The old genus Spirorbis Daudin has long presented difficulties, and its study seems to have been avoided by most workers. The group, unquestionably a natural one, is large, and probably only a small percentage of its forms have been made known. St. Joseph's separation of the several genera into which he divided it in such a way that other less closely related genera intervened, has met with protest. Caullery and Mesnil (Bull. sci., 1897, **30**, p. 183–233) in their valuable study of the group recombine St. Joseph's genera in Spirorbis which they then divide into subgenera to which they apply a wholly new set of names and for none of which they retain the name Spirorbis in a restricted sense. They make the divisions primarily on the character of the coiling of the tube, whether sinistral or dextral, making use then of the number of thoracic somites, place of incubation, character of the operculum and the setae. Miss Pixell in a more recent study (Proc. Zool. soc. London, 1912, p. 792 *et seq.*) adopts these subgenera and adds another. But if these divisions are accepted they must in part, under any conditions, bear names previously proposed. Thus Dexiospira would have to be replaced by Circeis St. Joseph, the name being also preceded by Janua and Mera of the same author, and Laeospira, containing the type of Spirorbis, must give way to the latter, and includes besides the earlier Pileolaria of Claparède. Miss Bush (Harriman Alaska Exped., 1910, 12, p. 256, etc.), while in general protesting against the use of characters not detectable by the naked eye or with a simple lens, for purposes of cataloging adopts groups based on the character of the collar setae, essentially corresponding to St. Joseph's. Whatever may be thought of the artificial character of the divisions proposed by Caullery and Mesnil on the one hand, and those of St. Joseph on the other, it seems that the more restricted groups arrived at by consideration of the characters used in both cases are homogeneous and natural. Hence, since the names are already available, I have restricted them as indicated in the key under Spirorbinae, as it is proposed for convenience to designate the larger group. I believe the characters of the setae primary to the others used, these probably resulting from progressive adaptation to the tube as the latter acquired the special form in its two diverging types. The types of the several genera and subgenera with the better known species belonging to each are indicated below. Because of the incompleteness of description many species cannot be with certainty placed at present.

Spirorbis Daudin (1800): *S. spirorbis* Linné (*S. borealis*), type; also in subgen. Spirorbis *sens. str.*, *S. beneti* Marion, *S. cornu-arietis* Philippi, *S. variabilis* Bush, *S. mediterraneus* Caullery and Mesnil, etc. In the subgenus Pileolaria, Claparède (1870) are, *e. g.*, *S. militaris* Claparède, type, and *S. quadrangularis* Stimpson, *S. mörchi* Levinsen, *S. langerhansi* Caullery and Mesnil, *S. bernardi* Caullery, and Mesnil, *S. koehleri* Caullery and Mesnil, and *S. similis* Bush.

Protolaeospira Pixell (1912): *P. ambilateralis* Pixell, type.

Paralaeospira Caullery and Mesnil (1897): *P. aggregata* Caullery and Mesnil, type; also *P. racemosa* Pixell, *P. malardi* Caullery and Mesnil, *P. patagonica* Caullery and Mesnil, *P. claparedi* Caullery and Mesnil, *P. lebruni* Caullery and Mesnil, and *P. levinseni* Caullery and Mesnil.

Spirorbides, gen. nov.: *S. cancellatus* (Fabricius) type; also including *S. vitreus* Fabricius.

Spirorbella, gen. nov.: *S. marioni* (Caullery and Mesnil), type; also *S. semidentata* (Bush).

Sinistrella, gen. nov.: *S. verruca* (Fabricius), type; also *S. media* (Pixell).

Janua St. Joseph (1894): *J. pagenstecheri* (Quatrefages), type; also *J. pusilla* St. Joseph (type of Mera St. Joseph).

Leodora St. Joseph (1894): *L. laevis* (Quatrefages), type; also in Leodora *sens. str.* are *L. valida* (Verrill), and *L. argutus* (Bush). In the subgenus Romanchella Caullery and Mesnil (1897) are *L. perrieri* (Caullery and Mesnil), type and *L. asperata* (Bush).

Circeis St. Joseph (1894): *C. spirillum* (Linné) (= *C. armoricana* St. Joseph), type.

Dexiospira Caullery and Mesnil (1897): *D. pseudocorrugatus* (Bush) (*D. corrugata* Caullery and Mesnil, which was first described but is preoccupied in Spirorbis) type; also *D. rugatus* (Bush), and *D. comptus* (Bush). In Dexiorbis, subgen. nov., are *D. foraminosus* Bush, type, *D. bellulus* (Bush), and *D. formosus* (Bush).

Paradexiospira Caullery and Mesnil (1897): *P. violaceus* (Levinsen), type.

The name Laeospira Caullery and Mesnil is suppressed, as its species fall either into Spirorbis or Pileolaria. We may regard it as proposed for the group for which Spirorbis should have been retained in the restricted sense.

Stoa Serres (1855) was proposed for two shell-boring serpulids (*S. perforana* and *S. spirulaeformis*). The species and the genus seem too incompletely characterized for certain identification.

Piratesa Templeton (1835) and Zopyrus Kinberg (1866) are also too incompletely known to be included in the key, their descriptions being particularly defective in lacking proper accounts or figures of the uncini.

Membranopsis Bush, though near Protula, cannot be taken up in the key.

Paravermilia and Metavermilia Bush are here included in Vermiliopsis St. Joseph.

Polyphragma Quatrefages (1865) is a synonym of Eupomatus Mörch.

Codonytes Quatrefages (1865) is in synonymy with Eucarphus Mörch.

Cymospira Blainville (1828) is a synonym of Spirobranchus Blainville (1817).

Heterodisca Fleming is regarded as synonymous with Spirorbis Daudin.

Spiroglypha Daudin (cited as Spiroglyphis by Grube), placed near Serpula, is probably not to be again recognized, as only the tubes of the two included species were observed.

Spiramella Blainville (1828) is the same as Protula Risso (1826).

POMATOCEROS Philippi.

Ann. mag. nat. hist., 1844, **14**, p. 155; Mörch., Naturh. tidsskr., 1863, ser. 3, **1**, p. 408.

POMATOCEROS PAUMOTANUS, sp. nov.

Plate **78**, fig. 6–9.

The type is clear yellow throughout except the operculum, which is distally paler, whitish.

The total length is 17 mm. The branchiae in their present condition extend 3.5 mm. beyond the thorax and distinctly exceed the operculum. The thorax is of the usual structure. The abdomen consists of about ninety-five somites; it is compressed dorsoventrally, in cross-section transversely elliptic; of uniform width throughout, excepting at the abruptly narrowed caudal end, which is obliquely truncated and, viewed from above, appears obtusely pointed; it is constricted a short distance in front of the caudal end; ventrally there is a slight sulcus along each side; dorsally there is the usual median longitudinal furrow which widens and deepens toward the caudal end.

The branchiae on each side form a compact brush in which the closely applied radioles are united proximally by a membrane. The branchiae in each group number about thirty. Each branchia has a short, naked tip almost as long as a pinna. (Plate **78**, fig. 9).

The operculum is a disc which is hemispherically elevated above. The rounded elevation, which covers the entire upper surface, bears three spines, of which the two posterior are longest, are proximally thick and distally pointed, and are curved or reflexed outward and forward. The unpaired spine is short and uncurved, broad at base and rapidlv narrowed to an acute point, being roughly in the form of a very low, broad cone. Along each side of the stalk and curving forwards beneath the disc is a conspicuous wing; the wings begin below the middle of the stalk. (Plate **78**, fig. 8).

The collar is ventrally high or long. In the midventral line it is notched, the notch rather shallow and rounded at the bottom. Also notched on each side. The dorsocephalic corner prominent, subrectangular, but with the apex narrowly rounded. Caudad on each side the collar is evenly continuous with the thoracic membrane, which is somewhat angularly elevated near the middle of its length and extends to the caudal end of the thorax, where it continues ventrally to unite beneath with the membrane of the opposite side.

The dorsal thoracic setae are rather short and comparatively numerous in each fascia. They are curved as usual toward the distal end and bear on the convex side of the curved portion a conspicuous wing. (Plate **78**, fig. 6). The abdominal setae are all broken off. The uncini are very numerous in each series on the thorax. Each uncinus bears at its cephalic end the usual distally blunt, ventrally furrowed process, and caudad of this, excepting in the reduced ones at ends of series, fifteen or sixteen fine, slenderly pointed teeth. (Plate **78**, fig. 6).

LOCALITY. Paumotu Islands: Fakarava. 12 October, 1899. One specimen.

From *P. strigiceps* Mörch, known from the region of Australia and New Zealand, this species is readily distinguishable by the marked differences in proportion and structure of the operculum, *e.g.*, the three spines or cornicles; *P. tricuspis* Phil., common in the Mediterranean, has fewer branchiae and the elevation on the operculum is higher, with the cornicles of very different form. *P. bucephalus* Mörch of the Philippine Islands, differs, *e. g.*, in having the elevated node of the operculum subcentral, with the margin of the disc elevated and the anterior spine decumbent.

SPIROBRANCHUS Blainville.

Bull. Soc. phil., 1818, p. 79; Oken's, Isis, 1818, p. 2062.
Cymospira BLAINVILLE, Dict. sci. nat., 1828, **57**, p. 431.

SPIROBRANCHUS TRICORNIS (Mörch).

Spirobranchus giganteus PALLAS, var. *tricornis* Mörch, Naturh. tidsskr., 1863, ser. 3, **1**, p. 404.
Spirobranchus tricornis EHLERS, Mem. M. C. Z., 1887, **15**, p. 292, pl. 57, fig. 8–15.

A single large specimen, which unfortunately had at some time been dry, is in the collection. It has an extreme length, inclusive of the branchiae, of about 113 mm., the abdomen measuring 83 mm. The abdomen narrows unevenly from the anterior end caudad; in its present shrunken condition the width at the anterior end is 7.5 mm., and that near the caudal end 3.2 mm. The color in general is similar to that frequent in *S. giganteus* and other close relatives of the West Indian region in having the anterior portion of the collar and much of the branchiae of a dark violet-brown color; the abdomen is somewhat greenish yellow. The calcareous plate of the operculum is almost circular, being slightly longer than wide (*cir.* 12 mm. × 11 mm.); the horns have the usual general structure and proportions. The collar ventrally is entire and produced cephalad, not incised as in *giganteus*. The uncini conform to type.

The tube is large, thick-walled, and but little curved. It is three-sided in cross-section, subtriangular. The smooth-walled bore has at one end, where broken off, a diameter of 10 mm. and at the other, where also broken off, a diameter of about 8 mm.

LOCALITY. Panama. 12 March, 1891.

PAUMOTELLA, gen. nov.

Operculum obconic, the distal surface slightly depressed within the margin but not infundibuliform, mesally weakly convex, without processes; margin entire, smooth.

Thorax consisting of seven setigerous somites.

Collar entire ventrally; sharply incised on each side.

Thoracic membrane well developed.

Thoracic setae alike on all somites, no special ones on the collar. Setae of thorax coarse, limbate, acutely tapering forms and fewer fine capillary ones. Uncini with teeth numerous and fine, the series ending on the side nearest prostomium in a tooth longer, stouter and more obtuse than the others, with the plate extending cephalad of this tooth; teeth progressively reduced in uncini towards ends of rows. Abdominal setae of anterior and median regions stout, moderately curved, acute spines; those of the more caudal somites very fine, long, curved distally where limbate, with tips entire.

GENOTYPE.— *P. takemoana*, sp. nov.

The general relationships of this genus are indicated in the key. In the general character of its thoracic setae it suggests Vermilia, but differs decidedly in its very characteristic abdominal setae, which are in no part geniculate or denticulate, and also very obviously in the form of the operculum. Ditrupa has the abdominal setae capillary and alike on all the somites.

PAUMOTELLA TAKEMOANA, sp. nov.

Plate **78**, fig. 1–5.

The general color is brownish yellow, with the parapodial processes paler. The thoracic collar is transparent. The branchiae yellow. Operculum yellow, with the rim black.

Thorax composed of seven setigerous somites. The abdomen is deeply longitudinally furrowed above and is flattened dorsoventrally, especially at the caudal end; at its anterior end is a region not distinctly segmented, followed by about fifty-five short setigerous somites. The total length of the type is about 18 mm., its coiled condition making precise measurement difficult. The width across the anterior end of the abdomen is 1 mm.; the width across the posterior end of the thorax abruptly greater, 2 mm.; while the width across the anterior end, inclusive of the collar membrane, is 3 mm.

Ventrally the collar is entire, projecting cephalad as a triangular flap. On each side the membrane is deeply incised, the incision separating the ventral flap from the dorsal division, which is continuous with the well-developed thoracic membrane. The thoracic membrane is high anteriorly and narrows gradually caudad to the end of the fifth somite, where it appears to discontinue abruptly.

The branchiae on each side are fifteen, or very near that number. They become strongly coiled distally. The radioles in the preserved condition are irregularly transversely wrinkled; each when cleared and magnified shows a segmentation. (Plate **78**, fig. 5). The radioles bear a double series of long slender pinnae from base to tip, these increasing in length distad. Each pinna bears numerous long, hair-like or ciliary processes along its sides. (Plate **78**, fig. 5).

The thoracic notopodial fascicles are of similar appearance throughout, and the setae are alike. The fascicles contain a minor number of more slender, narrowly limbate capillary setae and more numerous coarse setae which are obviously curved toward the distal end, at which they are drawn out into slender acute tips; each is broadly winged at the curve from where the wing gradually narrows and finally disappears both distad and proximad. (Plate **78**, fig. 2). The uncini have mostly twelve small teeth along the edge in addition to the larger tooth at the anterior end. Cephalad of the large tooth the edge is smooth for a short distance before it rounds about the anterior end. The number of teeth is progressively reduced towards the ends of each series, the end-plates reduced essentially to a single large hook. (Plate **78**, fig. 3). The abdominal setae of the anterior and median regions are stout, distally acute, curved spines which are somewhat compressed. There are three or four in a transverse series in each group. The setae of the caudal somites are very long and fine and straight, excepting at the distal ends, where curved, the curved region flattened, limbate, a furrow or depression along its middle region; apex acutely pointed. (Plate **78**, fig. 1, 4).

LOCALITY. Paumotu Archipelago: Makemo. Depth, 13 fms. From coral at bottom of lagoon. 19 October, 1899. One specimen.

SABELLARIIDAE.

In this family the body presents a very characteristic appearance due to the development from the first setigerous somite of two usually large lobes nearly always fused dorsally and extending forwards so as completely to obliterate the prostomium as a separate organ, though it is partially distinguishable between the lobes — the so-called opercular lobes — in one Madagascar form (*Cryptopomatus geayi* Gravier). These lobes seems to represent the greatly developed notopodial branches of the first somite, or peristomium, with which the prostomium is fused (Comp. rend. Acad. sci., 1908, **146**, p. 250). Dorsally each lobe bears an inner and an outer, with sometimes an intermediate, series of stout paleae of varied form, which together form an operculum. These paleae rarely almost obliterated (Cryptopomatus). On the ventral side of the lobes are series of ridges, or lamellae, bearing numerous branchial filaments presumably outgrowths of the palpi, which are fused with the lobes. From the prostomial area proper arise two tentacles. At the base of the principal opercular lobe on each side a small setigerous tubercle, the neuropodium of the corresponding somite, is ordinarily detectable (Caullery, Bull. Soc. zool. France, 1913, **38**, p. 198).

There is a distinct thoracic region embracing, in addition to the highly modified first setigerous somite, a second somite, in which only the neuropodium is represented similarly by a small fascicle of capillary setae, this being followed by three or four somites in which both neuropodia and notopodia are strongly developed. These are sometimes spoken of as the parathoracic somites. The notopodia of these somites are strongly developed, each consisting of a lamina more or less elongate vertically and bearing stout paleae and usually, in addition, some finer setae, the paleae and setae directed more or less obliquely caudad. The neuropodia are smaller, but bear corresponding, though finer, more weakly developed setae. In the abdominal region the notopodia are in the form of greatly elongate tori bearing uncini, while the smaller neuropodia bear each a fascicle of barbulate capillary setae. Dorsal cirri are present over most of the length of the body and appear to function more or less as branchiae.

The sabellariids for the most part construct tubes of sand which in some cases may be united in great numbers and form masses several feet thick. Sometimes the tubes of different species are united, as, for example, those of *Sabellaria alveolata* with those of *S. spinulosa* (St. Joseph, Ann. sci. nat., 1894, ser. 5, **17**, p. 159). They are essentially shallow water forms.

Key to Genera.

a. With no operculum..*Cryptopomatus* Gravier.
aa. With a well-developed operculum.
  b. Opercular lobes separated, each one bearing a single, somewhat spiral series of long paleae. *Phalacrostemma* Marenzeller.
  bb. Opercular lobes more or less fused dorsally, with paleae shorter and in two or three series.
    c. Paleae in two series.
      d. With dorsal hooks.
        e. With three parathoracic somites................................*Idanthyrsus* Kinberg.
        ee. With four parathoracic somites..................................*Tetreres* Caullery.
      dd. With no dorsal hooks..*Centrocorone* Grube.
    cc. Paleae in three series...*Sabellaria* Lamarck.

Synonymy of Genera.

Hermella Savigny (1820), Phragmatopoma Mörch, Psammatolus Guettard, and Chrysodon Oken, are synonyms of Sabellaria Lamarck.

Ariapithes and Lygdamis Kinberg (1866) are not sufficiently known to be placed with certainty.

IDANTHYRSUS Kinberg.

Annulata nova, 1866, p. 349.
Pallasia QUATREFAGES, Hist. nat. anneles, 1865, 2, p. 322.

IDANTHYRSUS CRETUS, sp. nov.[1]

Plate **75**, fig. 8–15.

The general color is a dilute yellowish. The branchiae are tinged with purplish, as is also the under surface of the opercular lobes. The cirri of the slender posterior region of the body are solid purple. The opercular paleae are golden yellow, some darker, more orange tinged, the thoracic ones paler and the other setae of the thoracic and abdominal regions unpigmented, in groups appearing white.

The total length, inclusive of the opercular folds, is nearly 20 mm., of which the slender faecal tube comprises 4 mm. The width across the anterior end of the abdomen is 2.7 mm. The width across the opercular lobes, exclusive of the palea, is 4 mm. Forty-two setigerous somites, or very near that number, are present.

The mouth is a triangular opening bordered on each side by a longitudinal palpal fold which is high and thin.

The opercular folds diverge conspicuously cephaloectad. Each fold presents a distal surface limited by paleae, which is narrowly elliptic in outline or more pointed at one end. There are two rows of paleae, an inner and an outer, the two series almost touching at the ends. The paleae of the inner series are thirteen to seventeen in number; they are all smooth and not very stout, narrowing from base to an acute apex and distally weakly curved. They increase in length and stoutness from the upper (mesal in type) to the ventral (ectal) end, those toward the latter end also being much closer together. They are longitudinally fibrillate and closely, finely cross-striate. (Plate **75**, fig. 11). The paleae of the outer series are sixteen to twenty in number. They are longer and much more conspicuous than those of the inner series and similarly increase in length and closeness toward the outer (ventral) end. They are all strongly plumose, the branches long and extending farther proximad on one side than on the other. Each shaft is acutely pointed and is curved at the tip; it is in part finely transversely lined. (Plate **75**, fig. 12). At the upper end of the series of paleae on each fold there is a single stout, very dark reddish, heavier nuchal hook, the distal portion of which is bent directly transversely and is not at all recurved. Along the outer edge of each outer series of paleae is a fold along the edge of which is a series of low, rather stout, papillae, the precise number of which was not determined.

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[1] cernere, to separate.

The gill-filaments are moderate in length, slender and numerous. The number of plates and the precise arrangement of these and filaments were not ascertainable.

The peristomium ventrally is concave anteriorly where bordering the mouth. On each side of the mouth it projects forward as a proximally very broad lobe, which narrows cephalad, is distally rounded and is widely separated from that of the opposite side. Proximally each lobe projects laterad as a thin, free, ectally convex lobe. At its ectal base arises a stout, subconical cirrus which extends cephalad and ends in a subacute tip. At the base of the cirrus is a setigerous tubercle which is very small.

The second setigerous somite is clearly separated from the first one. It bears on each side three conspicuous cirriform processes, one at base of setigerous lobe above, one of equal size farther dorsad, and at the level of the dorsum a third one which is decidedly longer and stouter than the other two. Each dorsal cirrus is transversely broad at base, flattened dorsoventrally, and narrows strongly distad.

The three following "thoracic" somites present each at the ventral border of each side a low neuropodial lobe bearing a fascicle of numerous paleae of moderate size. At the dorsal level of the side is a much stouter and longer, subcylindrical notopodial lobe which bears a fascicle of much longer and stouter paleae. On all of these somites on each side and in line with that of the first somite is a stout, proximally broad and flattened, distally acuminate, notocirrus (branchia).

The dorsum of the abdomen is mesally convex, with a longitudinal furrow on each side separating off a lateral branchiferous ridge. The venter is depressed as usual, two longitudinal and well-separated forms gradually diverging cephalad. The long neuropodial setae on each side project mesad and widely overlap those of the opposite side. The dorsal cirri, or branchiae, are stout and conical like those of the thoracic division with which they form continuous series. Those in the widest region of the abdomen are largest, these when laid mesad nearly touching each other at their tips, but separating more widely caudad until the slender posterior region is reached. The uncinigerous tori are inconspicuous. They lie on the sides between the cirri and the neuropodia, as usual.

The dorsal thoracic paleae are long and strongly flattened. Each widens gradually distad into a conspicuous entire blade which is distally unsymmetrical, one distal edge being more oblique, the tip narrowing to an acute point which is curved to one side; the blade is also moderately curved distally, at right angles to the flat surface. (Plate **75**, fig. 13, 14). In addition, there are in each paleae-bearing notopodium, a few stout setae not flattened, and narrowing uniformly to an acute tip. (Plate **75**, fig. 9). The ventral thoracic paleae are much more slender, with the shafts more uniform and widening more abruptly into a distal, sublanceolate, and usually symmetrical blade, which is also somewhat curved at right angles to the broad surface. (Plate **75**, fig. 15). The abdominal segments bear notopodial setae that are long and fine, forming small fascicles. (Plate **75**, fig. 8). The uncini are small and slender, with usually seven teeth. (Plate **75**, fig. 10).

LOCALITY. Near Panama: Taboguilla Island. In coral, 1 fm. below low tide-mark. 31 October, 1904. One specimen.

This species also belongs in the group to which *I. johnstoni* (McIntosh) pertains. It is very close to *I. armatus* Kinberg described originally from near Valparaiso, Chile, and known as common in the region of the Magellan Strait, which seems to be its center of distribution. Kinberg's description is insufficient, but Ehlers regards his *Pallasia sexungula* (and also *Hermella macropalea* Schmarda) as the same species, and comparisons may be made with his description and figures. The present species seems to be broader across the opercular lobes, these diverging more widely. The nuchal hooks, of which but one pair is present in place of the three pairs usual in *armata*, though this is possibly not so significant as was formerly thought, are very much stouter. The inner paleae are, relatively to the outer ones, much shorter. Ehlers's figure represents (Nach. K. gesellsch. wiss. Göttingen. Math. phys. klasse, 1897, pl. 12, f. 194) on the second setigerous somite four small, contiguous, cirriform processes between setae and the large dorsal cirrus, or branchia, whereas in the present species there are but two, these being relatively clearly longer and being widely separated. The mouth in *cretus* is broader anteriorly and the lateral folds are stouter and more widely separated.

IDANTHYRSUS REGALIS, sp. nov.

Plate **74**, fig. 1–8.

The head and gills are purplish brown, excepting for a longitudinal light area below the caudal half of the outer opercular ridge and a broad encircling band embracing also the first somite and adjoining the second. The papillae and the outer paleae are yellowish. The second somite is deep purplish brown in the dorsal furrow and a lighter, greyish brown adjoining this and down the sides. The third segment is similarly colored excepting that the grey-brown is confined to the anterior margin. Elsewhere these somites are yellow. The remaining part of the body is yellow, excepting for a short transverse stripe of dark purplish brown just above each neuropodium and extending a little past the lower end of the series of uncini. These dark spots become heavier caudadly.

The caudal portion of the body in the type is missing. As it is, there are twenty-four abdominal somites, making with the thoracic a total of twenty-nine. The length is 45 mm. The maximum width across anterior end of abdomen 7.5 mm. The width across opercular folds, near 10 mm.

The mouth is a small opening bordered in the usual way by the thin palpal folds.

The opercular lobes are widely divergent. Each opercular plate viewed from above is very narrow. It bears two rows of paleae, an inner one of dark, smooth ones, and an outer one of larger, yellow plumose ones which are nearly thirty in number and about twice as numerous as those of the inner row. At the caudal end of the series of paleae on each side is inserted a single stout, black, nuchal hook, the distal part of which bends in horizontally but is not recurved toward base. Along the outer side of the ectal paleae is a series of eighteen or twenty short, slenderly conical papillae. These do not vary much in size excepting the most caudal, which overhangs the nuchal furrow and is conspicuously stouter than the others.

Branchial plates oblique, with the outer ends curving cephalad. Twelve in number on each side. The filaments moderate in length, when extended apparently not reaching across the peristomial region. The filaments are dark purplish brown, while the plates are pale across their distal borders.

Behind the mouth is a pair of broad, subconical folds meeting at the middle line; these are pale along the mesal border, but elsewhere dark. From the outer side of each of these arises a smaller, pale, conical cirrus and at the outer base of the latter, in turn, a small setigerous papilla.

The next, or second, setigerous somite is not separated from the first ventrally. On each side it bears three cirri which are all stout, conical, and acutely pointed. The most dorsal, corresponding in form and position to the branchiae of the following thoracic somites, is the largest of the three, but is distinctly shorter than the length of the somite. The most ventral one is next in length. Below the ventral cirrus arises a fascicle of long setae.

The next succeeding three somites are longer. Each bears below a neuropodial fold from which springs a series of paleae of moderate size. Above this is the prominent notopodial ridge which bears a series of larger paleae. Above the notopodial ridge on each side is a basally stout, conical, dorsal cirrus or branchia.

The dorsum of the abdomen is flattened or somewhat concave. The ventral surface is grooved, the long neuropodial setae projecting over it and those from the opposite sides overlapping. Behind the setigerous process the neuropodium extends into an acutely pointed, postsetal lip. On the anterior and median somites the uncinigerous ridges, or tori, extend from the dorsal cirri or branchiae to the neuropodia. In the type cirri are present on somites to the twenty fourth, inclusive. They are longest near the middle of abdominal series. Each is gradually attenuated and conically pointed, those of the thorax being relatively much stouter than the following ones.

The inner opercular paleae are dark in color and smooth. The distal ends are acutely acuminate and curved mesad. (Plate 74, fig. 6). The outer paleae, excepting the most anterior, have the shafts distally acuminate, the acuminate portion long. Numerous rather long processes fringe each side. (Plate 74, fig. 7). At the anterior end the shafts are stouter and conspicuously clavate, with along each edge in place of the long, filiform processes, a series of shorter serrations. (Plate 74, fig. 8).

An ordinary neuropodial seta of the thorax is shown in Plate 74, fig. 1. The notopodial paleae of the last three thoracic somites are broad and flat, slightly and gradually enlarging from the base to the distal end, which is rather abruptly narrowed to a slender acute tip. (Plate 74, fig. 5). The neuropodial paleae of these somites are somewhat similar in form to the notopodials, but are smaller and more gradually attenuated distad. (Plate 74, fig. 4). The neuropodial setae of the abdominal somites are unusually long. They are of the usual general structure. (Plate 74, fig. 2). The uncini have the body slender. Typically each bears eight long, slender teeth, of which the longest are at the middle of the series and the smallest next to the inferior end. (Plate 74, fig. 3).

LOCALITY. Galapagos Islands: Chatham Island. 9 January, 1905. One specimen.

This species has anteriorly the violet-brown pigmentation that is so characteristic of *Pallasia pennata* Peters (*Hermella bicornis* Schmarda, *Pallasia sexhamata* Grube, *Sabellaria australiensis* Haswell, and *Pallasia porrecta* Ehlers); but to the naked eyes it appears strikingly different because of the large opercular lobes and their great divergence from each other, the diameter across the lobes in *pennata* being comparatively small. A characteristic difference is presented by the large dorsal thoracic paleae. These in the present species are shorter and broader and do not expand at all distally as they do in *pennata*, etc.

In structure this species is very similar to *I. johnstoni* (McIntosh). The dark brown pigment of the head is more extensive, covering the entire operculum and the branchiae, and the entire surface elsewhere excepting caudally. It differs also in the conspicuous dark marks above the neuropodia of the abdomen. In size it is very much larger, the maximum diameter across the thorax being 7.5 mm. as against 4.5 mm., while the width across the opercular lobes is 11 mm. The outer paleae are very much alike, as are also the inner ones, excepting that these have a curvature distally seemingly absent in *johnstoni;* but in both cases they are decidedly more numerous. The thoracic paleae are very similar. The papillae below the outer series of paleae are twice as numerous,— eighteen to twenty instead of seven to nine.

TETRERES Caullery.

Bull. Soc. zool. France, 1913, **38**, p. 198.

TETRERES NESIOTES, sp. nov.[1]

Plate **75**, fig. 1–7.

The body is a uniform yellow, excepting the operculum and immediately adjacent surface, which is a dark violet-brown. The inner opercular paleae are dark-colored throughout their length. The outer paleae are dark at tips, but elsewhere are pale yellow and transparent.

Behind the thoracic somites, the last four of which bear the rows of stout notopodial paleae, there are forty-eight to fifty abdominal somites in front of the narrowed caudal division of fecal tube which, in the type-specimens, is broken off near its anterior end. Exclusive of the fecal tube, the type is 32 mm. long, with a maximum width across abdomen of 5.8 mm. The width across the operculum is 5 + mm.

The prostomium fully concealed by the peristomium.

The mouth is a rather large, somewhat diamond-shaped, the opening immediately bounded on all sides by a thin, plate-fold which apparently represents the inner edges of the palpi, which are more or less completely fused dorsally with the peristomium.

---

[1] νησιώτης, islander.

Each opercular lobe viewed from in front and above is narrowly elliptic in outline, with the dorsal end the narrower. It bears two rows of paleae, an inner one composed of stouter elements, and an outer of smaller, paler ones. The inner paleae on each side in the type number near fifteen, the outer ones thirty-two. Caudad of the outer edge of the operculum on each side is a row of from twelve to fifteen slenderly conical papillae, all subequal in length. They have purplish spots like the branchiae. Contiguous with the most dorsal stouter papilla on its mesal side is a stout, dark hook crossing the corresponding one of the opposite side and sheathed proximally in a papilla. (Plate 75, fig. 7). Just in front of the nuchal hooks in the depression between the two opercular lobes is a long unpaired cirrus with a dark tip.

The branchial plates are set very obliquely on the ventral surface of each lobe and lie parallel with each other throughout, the lobes being straight and not curved mesad at distal ends. The plates are low, thin ridges, the distal margins of which are gently convex and bear the filaments. In a paratype in which the branchiae are particularly well exposed for study, there are on each side eleven plates. Of these the posterior ones each bear ten filaments. The anterior plates bear fewer. The filaments are long, slender, and thread-like, when fully extended reaching across the peristomium. They have the purplish tinge of the adjacent parts, the pigment commonly occurring in streaks and small spots.

Bordering the mouth-fold caudally is a conspicuous, longitudinally wrinkled, transverse ridge which, at each end on each side of the mouth, is raised into a stout, subcylindric but more or less flattened process. Adjoining this on the ectal side is a much longer, stout cirrus and at the ectal base of this, in turn, a setigerous tubercle. The process adjacent to the mouth on each side is typically transversely wrinkled and bears an abruptly narrower, small, distal lobe.

The second somite is short and distinctly separated throughout. On each side it bears four cirri. These are thick at the base, above which they are abruptly narrowed and are distad slenderly acuminate. They are subequal in length and are much longer than the somite. The most dorsal of these is in line with the dorsal cirri or branchiae of succeeding somites and has an identical structure; the most ventral one is below the setigerous neuropodial tubercle.

The succeeding four thoracic — or parathoracic — somites are longer. On each of these there is a prominent neuropodial tubercle from the ventral edge of which project a series of paddle-shaped setae, or paleae, much stouter than those of the preceding somites. Above this is a prominent, vertically elongate, notopodial ridge which bears a series of long, stout, paddle-shaped paleae. On each somite above this there is a well-developed dorsal cirrus or branchia.

The abdominal somites as usual are not clearly separated. They decrease in width caudad, at first gradually, and then, at the caudal end, very abruptly to the width of the fecal tube. Dorsally the abdomen is strongly convex, with a thin, semitransparent wall through which the viscera are visible. The ventral surface is flat, and mesally longitudinally grooved, with the walls thicker. The notopodial or uncinigerous ridges, or tori, on the anterior somites extend from the gills to the edge of the flat ventral surface, where each ends in a free lobe projecting over the plate-like neuropodial process bearing the ordinary setae. The upper end also projects freely. Caudad the tori become much shorter but remain of the same height, so that the free ends come to project over a constricted base and give each torus the form of a battle-axe. The branchiae, like those of the thoracic region, are well developed on the first seventeen to nineteen somites, thereafter disappearing abruptly. Each is marked with a longitudinal dark stripe.

The faecal tube is not complete in any of the type-specimens. Its proximal portion is bent forward and lies in the ventral abdominal groove, as usual. Its walls are thin. There are no indications of parapodia.

The inner opercular paleae number from twelve to sixteen on each side. They are dark-colored, stout and straight, narrowing distad to the narrowly, acutely rounded tip. Each shows a homogeneous cortex and a densely fibrillar medulla and also shows some cross-striations, which are often vague. (Plate 75, fig. 3). The outer opercular paleae on each side number from twenty-five to thirty-two. They extend obliquely forward. Each is pale and subtransparent, slender, widest at base, gradually narrowing at base and then of nearly uniform width to the abruptly acutely pointed apex, which is curved mesad. The extreme tip of this apical part is normally fine and acute and bent a little upward; it is easily lost. The medulla is fibrillar and strongly cross-striate at the distal end, or over most of the length, the striae becoming more vague proximad. (Plate 75, fig. 4).

The neuropodial setae of the four parathoracic somites are on each arranged in a single longitudinal series and project ectoventrad. In the type there are from five to seven in each series. They are coarse and paddle-shaped with the blade somewhat curved and its apex pointed. Longitudinally fibrillar, with the end often frayed through rubbing. At their bases are the usual shorter, fine capillary setae. On the abdominal somites the neuropodials are more numerous and are, in the main, much finer, plumose setae. The shaft of each is capillary and distally drawn out into a fine, more or less curved, tip. (Plate **75**, fig. 2). On at least some of the somites, a much coarser and longer, more or less remote, seta is present. The notopodial setae of the four parathoracic somites are very coarse paleae flattened in the cephalocaudal direction. They are somewhat oar-shaped, being, however, wide even at the proximal end, moderately enlarging distad, with the thin apical portion, when entire, moderately acute and somewhat curved caudad. The tip often frayed through use. (Plate **75**, fig. 5). The uncini are very numerous. They have the usual general structure. Each bears a series of mostly nine acute, overlapping teeth, which are longest at the middle of the plate. The blade of the uncini is transparent, narrow, and in outline somewhat clavate. (Plate **75**, fig. 1).

LOCALITY. Paumotu Islands: Makemo, Reef Flat. 20, 21 October, 1899. Two specimens.

Paumotu Islands: Fakarava. 12 October, 1899. One specimen.

This species has structural resemblances to *T. giardi* (McIntosh), taken off Port Jackson, Australia. The outer paleae of the operculum are similarly smooth and free from all denticulation along the edges. However, the paleae are proportionately very much shorter, do not have a similar fusiform outline, and are conspicuously bent at the distal end toward the center of the circle of which they form the circumference, instead of being bent outward. The specimens representing the present species indicate a much larger form than *giardi*. The papillae along the caudal side of the outer opercular paleae are longer and more uniform, and the cirri of the first thoracic somite are widely different. It seems also to have affinities with *laevispinis* Grube; but, among various other points, differs in having but two nuchal hooks instead of four.

INDEX.

abyssi, Paiwa 459
abyssicola, Ilyphagus 403
    Syllis 164
abyssorum, Eunoe 60
    Leptoecia 320, 264
    Lumbrinereis 324
Acholoe 38
Acicularia 153
Acoetes 86, 85
Acoetidae 85, 19
Acoetinae 85
Acrocirrus 372
acuminata, Ophelina 385
Admetella 64, 38
adriatica, Eunice 236
Adyte 40
affinis, Flabelligera 398
    Sternaspis 406
afra, Lysidice 231
agassizi, Uncinereis 216, 219
aggregata, Paralaeospira 478
Aglaophamus 93
Aglaopheme 93
Aglaura 326, 335
Aglaurides 326, 335
alata, Kainonereis 197
    Plotohelmis 144
alatum, Eunotophyllum 102
    Notophyllum 102
albini, Ancistrosyllis 166
albomaculatus, Corynocephalus 141
Alciopa 130
Alciope 130
Alciopidae 129, 22
Alciopina 129
alcyonia, Eurythoe 28
    Pleione 28
Alentia 38
Alitta 196
Allmaniella 38
Alluandella 166
alopecurus, Ophiothrix 36
alternata, Syllis 164
alticola, Lycastoides 194
alveolata, Sabellaria 484
Amaea 422
Amage 443
ambilateralis, Protolaeospira 478
Amblyosyllis 165
Ammochares 418
Ammocharidae 418, 20
Ammotrypane 385
Ammotrypanella 384
Ampharete 444, 443
Ampharetidae 440, 20
Ampharetides 422
Ampharetinae 442
Amphelothrix 231
Amphicora 471
Amphicteis 447, 514
Amphictene 463
Amphictenidae 461, 20
Amphictius 443, 514
Amphiglena 469
Amphinoma 27
Amphinome 26, 25
Amphinomidae 23, 22
Amphinomoidea 22
Amphioxus 383
Amphiron 231
Amphisamytha 444
Amphitrite 421
Amphitritea 422
Amytis 166
Anaitides 102, 100
Anaitis 102
Anamöbaea 470
Anaplosyllis 167
Ancistria 466
Ancistrosyllis 166, 177, 183, 185
Andromache 335
angelini, Rhynchonerella 146, 151
anglica, Phyllochaetopterus 365
Anisoceras 339
annulatorum, Ophryodedron 420
Anobothrus 444, 443
anomalus, Leocrates 190
anops, Sabellides 456
antarctica, Grubiella 456
    Laonomedes 469

antarctica, Maldanella 412
Vanadis 130, 134
antennata, Leodice 256
anticostiensis, Harmothoe 40
antillensis, Arenicola 394
Antinoe 39
Antiobactrum 385
Aonides 368
Aphlebina 422
Aphrodita 79
Aphroditella 79
Aphroditidae 78, 19
Aphroditoidea 19
Aphrogenia 79
Apisthobranchidae 21
Apomatopsis 473
Apomatus 473
Aponobranchus 422
Aporosyllis 174
appendiculatum, Prolopadorhynchus 119
Arabella 325, 329
Aracoda 325
Archidice 375
architectus, Mandrocles 410
arctica, Heteronereis 213
arcticus, Herpyllobius 99
Arenia 466
Arenicola 394
Arenicolidae, 392, 20
Arenicolides 394
areolata, Leanira 90
Sthenolepis 90
Areta 195
Arete 196
argus, Lepidasthenia 61
argutas, Leodora 478
Ariapithes 484
Aricia 354
Aricidia 362
Aricidiopsis 362
Ariciidae 353, 21
armandi, Onuphis 284
Armandia 384
Armandiella 384
armata, Pallasia 487
Syllidea 186
armatus, Idanthyrsus 487
armillaris, Lycastis 196
Nereis 196
armoricana, Circeis 478
Arripasa 471
Artacama 420
Artacamacea 423
Artacaminae 420
artifex, Hyalinoecia 315
Aryandes 443
ascendens, Ilyphagus 403
ascidioides, Herdmanella 36
Asclerocheilus 390
Aspeira 471
asperata, Romanchella 478
aspergillum, Euplectella 35
assimilis, Heteronereis 213
Sabella 468
Sternaspis 406
astericola, Acholoe 35
Asterope 131
astreae, Terebella 382
Asychis 409
atlantica, Chloenea 24
Leocrates 184
Melannopsis 444
atopodon, Pseudonereis 228
atypica, Odontosyllis 180
Auchenoplax 443
Audouinia 380, 372
aulogaster, Ammotrypane 383
aurantiacus, Astropecten 35, 184
auricoma, Amphitrite 463
auricula, Sabellides 456
aurifera, Palmyra 92
australia, Audouinia 381
australiensis, Dorvillea 343
Sabellaria 489
australis, Dorvillea 342
Austrophyllum 100
Autolytides 164
Autolytinae 164
Autolytus 167, 164
Axionice 423
Axiothea 410
Axiothella 410

baicalensis, Dybowscella 468
Balanochaeta 397
barbata, Sagitella 153
Trophonia 397
Bathya 421
Bathychloeia 25
Bathynoe 38

Bebryce 182
bellulus, Dexiorbis 478
beneti, Spirorbis 478
benthaliana, Chaetozone 371
　Laetmonice 82, 79
　Nichomache 408
benthalianus, Placostegus 473
Benthoscolex 25
bernardi, Pileolaria 478
Bhawania 92
Biborin 325
bicarinata, Enonella 326
bicornis, Hermella 489
bifilaris, Lumbriconereis 327
　Lumbrinereis 327
bilineata, Eulalia 102
　Hypoeulalia 102
billeti, Caobangia 468
bilobata, Leodice 255, 256
　Nicolea 425
bioculatus, Cirratulus 372
bispinosus, Astropecten 35
Bispira 470
bitorquata, Eunice 236
Blainvillea 232
bobretzkii, Sagitella 153
bocagei, Aphrocallistes 184
Boccardia 369, 368
bonelliae, Oligognathus 324
Bonhourella 474
borealis, Milnesia 79
　Spirorbis 478
bowerbanckii, Nereis 213
brachiata, Heterosyllis 166
Brada 399, 396
Branchethus 357, 354
Branchiomaldane 394
Branchiomma 468
branchiopoda, Glycera 344, 352
Branchiosabella 444
Brania 166
brasiliensis, Ophelina 385
breve, Lopadorrhynchus 114
brevispinis, Dorvillea 343
Buccinum 194
bucephalus, Pomatoceros 480
Buskiella 395. 396
Bylgia 40
Bylgides 37
bythincola, Ilyphagus 402
caeca, Eunoe 60
caenocirrus, Nereis 209, 206
Caesicirrus 409
californica, Euythoe 28
californicus, Stichopus 36
Callizona 146
Callizonella 130
campanulata, Axiothea 412
Campesyllis 165
cancellatus, Spirorbides 478
candida, Asterope 131
Canephoridea 423
cantrainii, Alciopa 130
　Liocapa 131
　Naiades 130
Caobangeinae 467, 514
Caobangia 470
Caobangiiniae 470, 514
capensis, Cirratulus 377
　Euphrosyne 34
capitata, Glycera 344
　Plotohelmis 144
　Rhynchonerella 143
Capitella 465
Capitellethus 465
Capitellidae 463, 20
Capitellides 465
Capitomastus 465
caput-esocis, Caulleriella 372
　Heterocirrus 372
Carchesium 396
cariboum, Semiodera 397
Carobia 108, 102
carpintieri, Dalhousiella 184
Carrazia 369
Cassandane 384
Castalia 185
Caulleriella 372
celox, Greeffia 139
　Nauphanta 139
Cenogenus 333, 325
Cenothrix 329, 325
Centrocorone 484
Ceratocephala 194
Ceratonereis 213, 195
cetrata, Thelepella 422
Chaetoparia 101
chaetopteri, Hypophorella 365
Chaetopteridae 363, 21
Chaetopterus 366, 365

- Chaetosphaera 369
- Chaetosyllis 174
- Chaetozone 372
- Chaunorhynchus 194
- chiajei, Audouinia 381
- chilensis, Pantoithrix 397
- Chitinopoma 475
- Chloeia 30, 25
- Chloenea 25
- Chloraema 398
- Chloraemum 398
- Chlorhaemidae 22
- Chone 470
- Chorizobranchus 394
- chrysocoma, Pontogenia 84
- chrysoderma, Cirratulus 371
- Chrysodon 484
- Chrysopetalidae 92, 21
- Chrysopetalum 92
- Chrysothemis 410
- cincinnata, Callizona 146
  - Rhynchonerella 146
- Circeis 475
- cirrata, Amphitrite 420
  - Psamathe 186
- Cirratulidae 370. 21
- Cirratulinae 371, 372
- Cirratulispio 372
- Cirratulus 374, 372
- Cirrhatula 375
- Cirrhatulus 374
- Cirrhineris 372
- cirrhosa, Gattyana 365
- Cirrineris 372
- Cirrobranchia 326
- Cirronereis 195
- Cirrophorus 362
- Cirrosyllis 183
- Cistenides 463
- citrina, Anaitides 102
- claparedi, Paralaeospira 478
- Claparedia 167
- clausii, Gastrodelphys 468
- clavata, Grubea 324
- Clistomastus 465
- Cloeia 30
- Clymene 410
- Clymeneis 471
- Clymenella 410
- clymenicola, Donusia 408
- Clymenides 394
- Clymenura 410
- cobra, Onuphis 300, 265
- Codonytes 479
- Coelobranchus 231
- coerulea, Nereis 195
- collarifer, Therochaeta 397
- Colobranchus 369
- commensalis, Flabelligera 396
  - Hololepidella 36
  - Lepidametria 36
- communis, Scalisetosus 36
- complanata, Aphrodite 28
  - Eurythoe 28
  - Pleione 28
- compsa, Anaitides 105, 103
- comptus, Dexiospira 478
- concharum, Cirratulus 381
  - Dodecaceria 381, 371
- conchylega, Onuphis 295
- Conconia 90
- congesta, Leodice 240
- coniceps, Plotobia 156
- contingens, Leodice 260, 232, 253, 255, 256
- contracta, Pisione 128
- convoluta, Glycera 345
- Coppingeria 396
- corallii, Naraganseta 382
- corallina, Eurythroe 28
- corethusa, Scalibregma inflatum 392
- cornu-arietis, Spirorbis 478
- corrugata, Dexiospira 478
- Corynocephalus 141, 130
- costata, Sternaspis 406
- Cothurnia 420
- crassa, Dorvillea 339, 343
- crassicolis, Cirrineris 374
- crassisetosa, Onuphis 295, 265, 305
- crenatus, Petaloproctus 410
- crenulata, Leucapina 36
- cretus, Idanthyrsus 485
- cristata, Arenicola 393, 394
- Crithida 167
- Crossostoma 447
- Crucigera 476
- cruenta, Arenia 466
- Cryptonota 25
- Cryptopomatus 484
- crystallina, Vanadis 133
- ctenosoma, Odontosyllis 324

cultrifera, Nereis 194
Perinereis 227
curta, Lepidasthenia 61
curva, Pontogenia 83
cylindrifer, Scoloplos 357
cylindrocaudatus, Ammotrypane 384
Urosiphon 384
Cymospira 481, 479
cynips, Ophiuricola 325
Cystonereis 166
Cystopomatus 473

Dalhousia 190
Dalhousiella 185
danielseni, Cirratulus 379
Danymene 326
darwini, Eupista 420
Eupistella 420
Dasybranchus 465
Dasychone 472, 469
Dasychonopsis 472, 469
Dasymallus 466
Dasynema 476
defendens, Aphrodita 80
delus, Sabellides 455
Demonax 470
Dendronereis 194
densa, Cydippe 129
denticulata, Nereis 213
deroderus, Pabits 457
descendens, Coenogenus 333
Desmosyllis 165
Dexiorbis 475
Dexiospira 475
Dialychone 470
dibranchiata, Euglycera 350
Glycera 350
dibranchiatus, Rhynchobolus 350
Didymobranchus 25
digueti, Lepidasthenia 36
dinardensis, Myxicola 467
Dindymene 385
Dindymenides 385
Diopatra 264
diphyllidia, Oenone 337
Diplobranchus 93
Diplocerea 167
diplochaitos, Siphonostomum 398
Disoma 370
Disomides 369
Disomididae 369, 21
dispar, Chonephilus 468
Distylia 468, 471
Ditrupa 476
diversicolor, Nereis 193
Dodecaceria 381, 372
Dodecaceriinae 371, 372
dolichopus, Admetella 67
Dorvillea 339
Dorvilleidae 338, 20
Dorvillia 339
Drieschia 37
Drilonereis 325, 329
dujardini, Chloraema 398
dumerili, Nereis 193
Dybowscella 468, 469, 471
Dysponetus 92
dysteri, Salmacina 473

ebranchiata, Eunice 236
echidna, Aphrodita 81
echinata, Hircina 420
echini, Scalisetosus 36
ectopa, Nepthys 94
edwardsii, Alciopa 131
Chloraema 398
Krohnia 131
Lophiocephalus 398
ehlersi, Hesione 190
Onuphis 284, 290
Ehlersia 174
Eisigella 465
elegans, Bispira 467
Laonome 467
Lepidasthenia 61
Onuphis 295
Paranereis 195
elongata, Rhodinicola 408
Samythella 444
elongatus, Sabelliphilus 468
Enipo 39
Enonella 325
Enopteris 158
entypa, Chloeia 30
Eone 363
Ephesia 183
Ephesiella 182
Epicaste 363
epipolasis, Telake 346
Eracia 101

Eranno 327
eremita, Goniada 363
Eriographidae 471
Eriographides 471
Eriographis 471
Eriphyle 232
errans, Mastigethus 120
Errantia 383
eruca, Balanochaeta 397
    Trophonia 397
erucaeformis, Dorvillea 343
erythraensis, Aglaurides 338
escrichti, Amphitrite 463
esculentus, Echinus 36
Eteone 99
Eteonella 101
Eteoninae 99, 125
Euarche 86
Eucarphus 476
Eucarunculata 25
euchaeta, Tomopteris 159
Euchone 470
Euclymene 409
Euclymeninae 409
Eucranta 39
Eudistylia 468
Euglycera 350
Eugrymaea 421
Eulagisca 38
Eulalia 100
Eulalides 102
Eulepethinae 89, 514
Eulepethus 89
Eulepidinae 89, 514
Eulepis 90
Eumenia 390
Eumida 100
Eumolpe 61, 74
Eumolphe 51, 64
Eunereis 193, 195
Eunice 232
Eunoa 58
Eunoe 58, 39
Eunomia 101
Eunotomastus 465
Eunotophyllum 102
Eupanthalis 85
Euphione 38
Eupholoe 89
Euphrosine 32
Euphrosyne 32
Euphrosynidae 32, 22
Eupista 424
Eupistella 421
euplectellae, Polynoe 35
Eupolymnia 432, 421
Eupolynoe 40, 51
Eupolyodontes 85
Eupomatus 476
Eupompe 86
eura, Eunoe 58
    Tomopteris 160
Euratella 469
Eurato 469
Eurymedusa 167
eurystethus, Terebellides 438, 420
Eurysyllis 165
Eurythoe 27, 25
Eusamytha 444
Euscione 421
Eusthenelais 90
Eusyllinae 165
Eusyllis 165
Euthalanessa 90
Euthelepus 422
Euzonus 384
Evarne 40
Evarnella 39
Exogone 165
Exogoninae 165
Exotokas 166
explorans, Moyanus 452

Fabricia 470
fakaravae, Ceratonereis 213
fakaravana, Phyllodoce 108
Fallacia 186
fasciata, Myrianida 167
fasciatus, Oxydromus, 185
Fauvelia 165
ferbilis, Notomastus, 466
ferox, Nereis 195
ferruginea, Nereis 213
fibrillata, Maldanella 413
filamentosus, Leocratides 184
filicornis, Dorvillea 343
    Spio 315
filigera nesophila, Audounia 380
Filograna 475
Filogranula 475

- fimbriata, Nereis 213
- fimbriatus, Heterocirrus 382, 371
- Flabelligera 398, 396
- Flabelligeridae 394
- flacida, Tecturella 398
- flava, Chloeia 31
- flavofasciata, Leodice 256
- flavum, Sphaerodorum 183
- Flemingia 397
- flexuosa, Nereis 185
- flexuosus, Oxydromus 184
- foliosa, Nerine 367
  - Phyllodoce 102
- foliosum, Notophyllum 101
- fonensis, Danymene 326, 514
- foraminosa, Dexiorbis 478
- formosa, Vanadis 134, 133
- formosus, Dexiorbis 478
- fossor, Sternaspis 405, 406
- fouensis, Danymene 338, 514
- fragilis, Cirratulus 372
  - Ophiothrix 36
- fragosa, Paradiopatra 310
- Frenna 37
- fucata, Leodice 230
  - Nereis 194
- fulgens, Nereis 213
  - Rhynchonerella 143
- fulgida, Aglaura 326
- fundicola, Glycera 352
- fusca, Castalia 184
  - Nereilepas 213
  - Psamathe 185
- fusco-punctata, Vanadis 134
- fusigera, Sige 101
- fusus, Kesan 386, 383

- galapagensis, Nicolea 427, 425
  - Pseudonereis 229
- Galeolaria 475
- Gastroceratella 39
- Gattiola 167
- Gattyana 39
- gazellae, Corynocephalus 141
- geayi, Cryptopomatus 483
- gelatinosa, Halosydna 35
  - Siphonostoma 398
- gelatinosum, Siphonostomum 398
- genetta, Hesione 186
- Genetyllis 100
- geophiliformis, Onuphis 295
- giardi, Tetreres 493
- gigantea, Leodice 230
- giganteus, Spirobranchus 481
- glabra, Eumenia 390
- Globidoce 100
- Glossopsis 476
- glutinatrix, Paradiopatra 310
- Glycera 350, 344
- Glycerella 344
- Glyceridae 343, 20
- Glyceroidea 20, 363
- Glycinde 363
- Glyphanostomum 443
- Gnathosyllis 174
- godlewski, Dybowscella 468
- Goniada 363
- Goniadidae 362, 20
- Gossia 167
- gracilis, Ephesia 183
  - Herdmanella 37
  - Onuphis 315
  - Phyllochaetopterus 366
  - Phyllodoce 111
  - Rhynchonerella 143, 146, 151
  - Sabellachares 468
- grandifolia, Nereis 213
- grandis, Vanadis 133
- granulata, Cistenides 463
- Greeffia 139
- greeffiana, Vanadis 134
- gregarica, Dorvillea 338
- grimaldi, Nectochaeta 48
- groenlandica, Anaitides 103
  - Ancistrosyllis 166
  - Pectinaria 463
- groenlandicus, Oligobranchus 392
- Grubea 167
- grubei, Ampharete 442
  - Rhynchonerella 146, 149
- Grubeosyllis 167
- Grubianella 443
- Grymaea 423
- Gwasitoa 390
- Gyptis 185

- Haematocleptes 325
- Halimede 186
- Haliplanes 101
- Halithea 79

Halla 326
Halodora 139, 130
Halosydna 38
Hanchiella 419
Haplobranchus 469, 471
Haplosyllis 174
Harmopsides 48, 37
Harmothoe 51, 39
Harpochaeta 186
hastigerens, Admetella 64
Haswellia 85
Hauchiella 422
Hediste 202, 196
Hedyle 227, 196
Hekaterobranchus 369
helleri, Nereis 227
    Perinereis 227
Hemiglycera 344
Hemilepidia 38, 35
Hemipode 344
Hemipodia 348, 345
Hemipodus 348, 344
Hemisyllis 165
henseni, Rhynchonerella 146, 151
Heptaceras 264
Herdmanella 39
Hermadion 39
Hermella 484
Hermenia 38
Hermodice 26, 25
Hesione 186, 185
Hesionidae 183, 23
Hesperalia 165
Hesperophyllum 100
heterochaetus, Eumenia 390
    Oncoscolex 390
Heterocirrus 381
heterocirrus, Anaitides 102
Heteroclymene 409
Heterodisca 479
Heteromaldane 408, 409
Heteromaldaninae 408, 409
Heteromarphysa 232
Heteromastides 465
Heteromastus 465
Heteronereis 202, 193
Heteropale 92
Heterophenacia 437
Heterophyselia 424
Heteropolynoe 38
Heterosyllis 166
Heteroterebella 424
hexactinellidae, Lagisca 35
hiatidentata, Onuphis 295, 299, 305
Hipponoe 25
hirsuta, Harmothoe 51
holobranchiata, Onuphis 295
Hololepida 38
Hololepidella 40
homa, Ampharete 444
humilis, Clypeaster 36
Hyalinoecia 310, 264
Hyalopomatopsis 475
Hyalopomatus 476
Hydroides 476
Hypephesia 182
Hypereteone 99
Hypoeulalia 101
Hypsicomus 469

Ichthyotomidae 166
Ichthyotomus 166
Idalia 423
Idanthyrsus 485, 484
idiura, Tomopteris 161, 160
Ilyphagus 402, 396
incerta, Dorvillea 342
incompleta, Eulalia 102
    Mesoeulalia 102
index, Lumbrinereis 328
indica, Leodice 240
inflatum, Scalibregma 392, 390
infundibularis, Flabelligera 398
infundibulum, Amphitrite 471
innatans, Polynoe 70
    Tomopteris 159
insignis, Chaetopterus 366
insulana, Eupolymnia 434
intermedius, Lipobranchius 391
intertexta, Hesione 188
Intoshella 391
Ioda 174
Iospilidae 127, 22
Iospilus 128
Iphianissa 409
Iphinereis 219, 196
Iphione 64, 37
Iphionella 64, 37
Iphitime 231
irenaia, Brada 400

- iridescens, Onuphis 295
- iris, Lamprophaes 190
  - Leocrates 190
- Irma 185
- irregularis, Astropecten 35
  - Lepidasthenia 61
- islandica, Sternaspis 406
- Isocirrus 409
- Isolda 443
- Isomastus 465
- Isosyllis 165

- jagasimae, Panthalis 88
- Janita 475
- Janua 475
- japonica, Lumbrinereis 328
  - Rhynchonerella 146
- Jasmineira 471
- jeffreysi, Polyphysia 390
- johnstoni, Idanthyrsus 487
  - Lepidonotus 74
- Johnstonia 202, 410
- Josephella 476
- juvenalis, Hyalinoecia 315

- Kainonereis 196, 194
- kamehamecha, Eurythoe 28
- Kebuita 390
- kefersteini, Dorvillea 339
- Kefersteinia 185
- Kermadecella 39
- Kesun 385, 384
- kinbergi, Eupanthalis 85
- Kinbergia 97, 101
- kobiensis, Nereis 216
- koehleri, Pileolaria 478
- kowalewskii, Sagitella 153, 152
- Krohnia 130
- krohnii, Alciopa 134
  - Lopadorrhynchus 114

- Labidognathus 325
- Labranda 372
- Labrostratus 325
- Lacydonia 128
- Lacydoniidae 128, 22
- Ladice 385
- Laenilla 39
- Laeospira 478
- Laetmatonice 81
- Laetmonice 81, 79
- Laetmonicella 81
- laevis, Leodora 478
- laevispinis, Tetreres 493
- Lagis 463
- Lagisca 39
- Lais 326
- Lalage 174
- lamarcki, Audouinia 381
- lamellifera, Anaitides 103
  - Nereis 103
  - Phyllodoce 104
- lamelligera, Nereis 103
  - Phyllodoce 103
  - Pionosyllis 324
- laminosa, Phyllodoce 104
- Lamproderma 186
- Lamprophaes 190
- Lanassa 420
- lanceolata, Armandia 383
- langerhansi, Pileolaria 478
- Langerhansia 40, 174
- Lanice 421
- Lanicides 421
- Laomedora 166
- Laonice 368
- Laonome 469
- Laonomedes 469
- Laphania 421
- Laphaniella 423
- lapidaria, Terebella 420
- Lapithas 166
- Larymna 325, 329
- latens, Nicolea 430
- latericeus, Notomastus 466
- latericia, Antheria 408
- latocinata, Vanadis 134
- latum, Branchethus 358
- Leaena 420, 423
- Leanira 90
- lebruni, Paralaeospira 478
- Ledon 372
- Leiocephalus 410
- Leiochone 409
- Leiochonini 409
- Leiochrides 465
- Leiochrus 465
- Lenora 27
- Leocrates 190, 185
- Leocratides 185
- Leodice 232, 231

Leodicidae 229, 20
Leodicoidea 20
Leodora 475
Leonnates 194
Leontis 219, 196
Lepidametrea 38
Lepidasthenia 61, 38
Lepidonotus 74, 70, 38
Lepidopleurus 91
Leprea 424
lepta, Onuphis 290, 265, 295, 299
Leptochone 471
Leptoecia 319, 264
Leptonereis 194
leuca, Nereis 205
leucacra, Hyalinoecia 317
Leucia 39
leuckartii, Chaetopterus 366
leucodon, Eunice 236
Leucodore 369
Leucodoridae 370
levinseni, Paralaeospira 478
Levinsenia 362
levukaensis, Eurythoe 28
limacina, Ophelia 383
limbata, Euphrosyne 34
lineata, Anaitis 102
  Paracarobia 102
Linopherus 27
Liocapa 131
Liocape 131
Lipephile 227, 196
Lipobranchius 390, 514
Lipobranchus 391, 514
Lirione 25
lita, Leodice 240, 232
litabranchia, Onuphis 274, 265
Lithothamnion 371
littoralis, Paractius 339
lobata, Dorvillea 339
Loimia 420, 514
longa, Nainereis 357
longicauda, Vanadis 134
longicirra, Lamproderma 186
  Mastigonereis 195
longicirrata, Pelagobia 122
longicirris, Kinbergia 101
  Phyllodoce 101
longipedata, Admetella 65
longisetis, Nereis 193
longisetosa, Saphobranchia 397
longissima, Eunereis 193
  Myriana 167
  Rhynchonerella 143
  Vanadis 134
Lopadorrhynchinae 98
Lopadorrhynchus 113, 100
Lophiocephalus 398
Lophonta 32
Loranda 325
loveni, Rhodine 408
Loxochona 409
lucida, Oenone 326, 337
Lugia 99
Lugiinae 99, 125
Lumara 437
lumbricalisa, Nichomache 408
Lumbriclymene 409
Lumbriclymeninae 409
lumbricoides, Euchymene 408
Lumbriconereis 327
Lumbrinereidae 324, 20
Lumbrinereinae 325
Lumbrinereis 327, 325
lunulata, Harmothoe 36
lütkeni, Trachelophyllum 101
Lycastis 174, 196
Lycastoides 194
Lycoris 202
Lygdamis 484
Lysarete 325
Lysaretinae 325
Lyscilla 422
Lysidice 231
Lysippe 443
Lysippides 443

MacDuffia 232
Macellicephala 38
Maclovia 326
macrobranchiata, Onuphis 295, 299
macroceros, Pterocirrus 99
  Sige 99
Macrochaeta 372
macrolepidota, Phyllodoce 102
macropalea, Hermella 487
Macrophyllum 101
macropthalma, Kinbergia 101
  Phyllodoce 101
maculata, Anaitides 103

maculata, Chloeia 31
  Goniada 363
  Lepidasthenia 61
  Lirione 26
  Notopygos 26
madeiriensis, Anaitis 104
  Phyllodoce 104
Magalia 186
Magelona 368, 370
Magelonidae 370
maggiae, Pontogenia 84
maior, Sternaspis 406, 514
major, Sternaspis 405, 514
makemoana, Leodice 233, 232, 247, 249
Malacoceros 369
malardi, Paralaeospira 478
Maldane 409
Maldanella 412, 409
Maldanidae 20, 407
Maldaninae 409
Maldanopsis 410
Malmgrenia 38
mammilata, Brada 399
Manayunkia 469
Mandrocles 410
Mania 186
mannognathus, Onuphis 269, 514
Marenzelleria 368
margaritacea, Lycoris 213
margaticera, Nereis 213
marina, Arenicola 393
marioni, Spirorbella 478
Marphysa 231
Mastigethus 119, 100
Mastigonereis 202
Mastobranchus 465
Mauita 135, 130
Maupasia 101
Mayeria 232
media, Sinistrella 478
medipapillata, Phyllodoce 111
mediterreanea, Amphiglena 468
mediterreaneus, Spirorbis 478
medusa, Noimia 420, 514
Megachone 470
megalus, Cirratulus 375, 378, 381
melanopthalma, Rhynchonerella 146
Melinna 443, 441
Melinninae 443
Melinnopsis 443
Melobesia 371
Meloenis 39
Membranopsis 479
Mera 478
meridionalis, Audouinia 381
  Sonatsa 416, 408
Mesochaetopterus 365
Mesoeulalia 102
Mesomystides 101
Mesospio 368
Metachone 470
Metalaonome 468
Metavermilia 479
mexicana, Harmothoe 54
mexicanus, Hemipodus 349, 344
microcephala, Alciopa 131
Microclymene 409
microlepis, Lepidasthenia 61
Micronereis 194
microprion, Leodice 256
micropthalma, Nereis 195
Micropthalmus 185
Microspio 368
Microsyllis 166
militaris, Pileolaria 478
Milnesia 79
minikoensis, Lepidasthenia 61
minuta, Glycera 345
  Vanadis 133
minutus, Schlerocheilus 391
möbii, Rhynonerella 146
monilicornis, Eusyllis 324
moniliferus, Stylarioides 397
monoceros, Moyanus 452
Moranis 514
Morants 368, 514
mörchi, Pileolaria 478
mossambica, Marphysa 231
Moyanus 451, 440, 443
mucosa, Anaitides 99, 103
müllerii, Typhloscolex 152
multibranchiata, Leodice 256
multicirris, Eulalia 102
  Paraeulalia 102
multipectinata, Leodice 256
muricata, Flemingia 397
  Iphione 40
mutans, Cenothrix 330
Mylitta 410
Myriacyclum 101

myriacyclum, Myriacyclum 101
    Notophyllum 101
Myriana 164
Myrianida 167
Myriochele 418
myrtosa, Euphrosyne 34
Mysta 99
Mystides 99
Mystidinae 99
Myxicola 469

Naidonereis 354
Nainereis 354
Namanereis 194, 196
Naneva 422
nannognathus, Onuphis 270, 265, 514
Nans 125, 97, 99
nans, Harmopsides 47, 514
    Lopadorrhynchus 116, 114, 119
    Mauita 136
    Plotolepis 41
Nantinae 125, 514
Naraganseta 381
nasuta, Rhynchonerella 143, 151
natans, Harmopsides 48, 514
Natinae 99, 514
nationalis, Prolopadorhynchus 119
Naumachius 227, 193, 195
Nauphanta 139, 232
Nausica 232
Neanthes 195
nebulosa, Onuphis 279
Neco 410
Nectochaeta 37
Nematonereis 231
Nemidia 39
Neoamphitrite 421
Neolepea 422
Neosabellides 442
Neottis 437
neo-zelandica, Maldanella 412
Nepthydidae 92, 22
Nepthys 93
Nereidae 191, 22
Nereidonta 232
Nereilepas 202, 196
Nereimyra 167
Nereiphylla 100
Nereis 202, 195
Nereisyllis 167
Nerine 368, 370
Nerinidae 370
Nerinides 368
Nerinopsis 369
nesiotes, Cirrineris 373
    Leodice 253, 232, 256
    Polynoe 72
    Tetreres 490
nesophila, Audouina filigera 380
nesophilus, Lepidonotus 75
Nevaya 391
Nichomachinae 409, 410
Nicidion 231
Nicolea 425, 421
Nicomache 409
Nicomachella 410
Nicomedes 196
Nicon 196
Nicotia 167
nigromaculata, Dasychone 472
    Dasychonopsis 472
    Sabella 472
Ninoe 325
Nitetis 384
Nodosaria 310
Normia 420, 514
Norepea 40
Northia 265
norvegica, Aricia 354
    Leodice 230
norvegicus, Chaetopterus 366
Nossis 195
Notalia 100
Notaulax 469
Nothis 101
Nothria 265
Notocirrus 325
notomacula, Nereis 216
Notomastus 466, 465
Notophyllum 100
Notoproctus 410
Notopsilus 325
Notopygos 25
Nychia 40

obliquatus, Autolytus 168, 174
obscura, Nereis 195
obscurior, Amphicteis 447, 449
occidentalis, Eucranta 40
Octobranchus 422

oculata, Anaitides 103
  Genetyllis 98
Odontosyllis 180, 165
oele, Lysidice 230
Oenone 334, 326
Oeorpata 443
oerstedi, Anamöbaea 470
  Panthalis 85
  Pisione 128
olens, Travisia 389
oliga, Leodice 244, 232, 249
  papeetensis, Leodice 248, 232
Oligobranchus 391
Oligognathus 325
Omaria 384
Omphalopoma 754
Omphalopomopsis 475
onanaryensis, Eisigella 465
Oncoscolex 391
Oniscosoma 25
Onuphididae 263, 20
Onuphis 265, 264
Oophylax 166
Ophelia 384
Opheliidae 382, 21
Opheliinae 384
Ophelina 385
Ophiodromus 185
Ophioglycera 363
Ophryotrocha 339, 419
Opisthodonta 165
Opisthosyllis 165
Oria 471
Oriades 470
Oriopsis 470
ornata, Amphitrite 36
  Vanadis 134
orphnius, Amphicteis 450, 448
Orseis 185
Orthodromus 185
Otanes 440, 442
Othonia 471
Otopsidae 128, 22
Otopsis 128
ovalifera, Phyllodoce 111
ovata, Iphione 64
Owenia 418
Oweniidae 418
Oxydromus 185
Pabits 456, 441, 443
pachytmena, Onuphis 279, 265, 290
pacifica, Eurythoe 28
  Eusamytha 444
  Hesione 186
  Moyanus 452
  Oenone 338
  Terebella 425
Paecilochaetus 370, 514
Paedophylax 167
pagenstecheri, Janua 478
Pagenstecheria 174
Paiwa 459, 444
Paleanotus 92
Pallasia 485
pallasii, Amphinome 27
pallida, Eulalia 99
  Onuphis 295
Palmyra 92
Palmyreuphrosyne 32
Palmyridae 92, 21
Palmyropsis 92
Palolo 230
paloloides, Leodice 230
panamena, Hesione 188
  Leodice 256, 232
  Terebella 424
panamensis, Panthalis 86
panamica, Euphrosyne 33
pannosus, Naumachius 195
Panthalis 86, 85
pantherina, Hesione 190
Pantoithrix 397
papeetensis, Leodice oliga 248
papillosa, Euchone 468
papillosum, Siphonostomum 398
Paracarobia 101
Parachloeia 25
Parachonia 470
Paractius 339, 419
Paradexiospira 475
Paradiopatra 264
Paraeulalia 102
Paraeulepis 89
Paraiospilus 128
Paralacydonia 97, 101
Paralacydoniinae 101
Paralaeospira 474
Paralaonome 469

Paramarphysa 231
Paramphinome 25
Paranaitis 100
Paranereis 227
Paranorthia 264
Paranychia 39
Paraonidae 361, 21
Paraonides 362
Paraonis 362
Parapolynoe 40, 70
Parasabella 469
parasitica, Harmothoe 36
parasiticus, Labidognothus 324
    Labrostratus 324
Parasitosyllis 166
Parathelepus 423, 514
Parathelpus 422, 514
Parautolytus 165
Paravermilia 479
Paraxiothea 409
Paronuphis 306, 264
parva, Rhynchonerella 150, 146
parvum, Lopadorrhynchus 114
patagonica, Anaitides 104, 102
    Carobia 104
    Paralaeospira 478
paumotanus, Corynocephalus 141
    Pomatoceros 479
Paumotella 481, 476
paupera, Eurythoe 28
    Leodice 244
pauroneurata, Leodice 249, 232
pavonina, Sabella 468
Pectinaria 463
Pedinosoma 99
Peisidice 85
Peisidicinae 85
pelagica, Drieschia 35, 45
    Nereis 213, 193, 194
    Torea 131
    Vanadis 134
Pelagobia 122, 99
pellucida, Drieschia 41
pellucidum, Chloraemum 398
Pelogenia 91
Pelogeniidae 92
pelseeneri, Hersilionides 408
pennata, Hermodice 26
    Pallasia 489
perarmata, Syllidea 186
perforana, Stoa 479
pergamentaceus, Chaetopterus 366, 364
Peribaea 185
Periboea 166
pericensis, Thelepus 437
Perinereis 227, 195, 196
peripatus, Ephesia 182
    Ephesiella 182
    Pollicita 182
Perolepis 38
peronea, Polynoe 40
perrieri, Romanchella 478
Petaloproctus 410, 409
Petta 463
Phalacrophorus 128
Phalacrostemma 484
Phenacia 437
Pherea 421
Pherecardia 25
Pherecardites 25
Pherusa 397
Pherusidae 397
Phisidia 420
Pholoe 89
Photocharis 180
Phragmatopoma 484
Phyllantinoe 39
phyllobranchia, Nephtys 93
Phyllochaetopterus 364, 365
Phyllocomus 443
Phyllodoce 108, 100
Phyllodocidae 97, 22
Phyllodocinae 100
Phyllodocoidea 22
Phyllonereis 195
Phyllosyllis 164
Physalidonotus 38
Physelia 423
Phyzelia 423
Pileolaria 478
pinnigera, Nereis 167
Pionosyllis 165
Pirakia 100
Piratesa 479
Piromis 396
Pisenoe 195
Pisione 128
Pisionidae 128, 21
Pista 421
Placostegopsis 474

Placostegus 474
plance, Cucumaria 339
planiceps, Isocirrus 415
planipalpus, Autolytus 170
platybranchis, Hyalinoecia 315
Platynereis 219, 195
Platysyllis 166
Pleione 26
Plioceras 326
ploa, Podarmus 46
Plotobia 154, 152
Plotohelmis 143, 130
Plotolepis 40, 37
plumosa, Flemingia 397
pluto, Ilyphagus 403
Podarke 185
Podarmus 45, 37
podocirra, Mastigonereis 195
Poecilochaetus 370, 514
Pollicita 182
Polybostrichus 167
polybranchia, Boccardia 369
    Polydora 369
Polycirridea 423
Polycirrinae 422
Polycirrus 422
Polydora 369, 370
Polydorella 369
Polydoridae 370
Polyeunoa 39
Polylepididae 91, 19
Polylepis 91
Polymastus 167
Polymnia 432
Polymniella 421
Polynice 166
Polynoe 70, 39
Polynoella 39
Polynoidae 35, 19
polynoides, Notophyllum 102
    Pseudonotophyllum 102
Polyodontes 86
polyopthalma, Armandia 383
Polyopthalminae 384
Polyopthalmus 384
Polyphragma 479
Polyphysia 390
polyscalma, Platynereis 219, 193
polytricha, Harmothoe 52
Pomatoceropsis 474
Pomatoceros 479, 474
Pomatoleios 474
Pomatostegus 474
Pontodora 127
Pontodoridae 127, 22
Pontogenia 83, 79, 92
porrecta, Pallasia 489
Porroa 101
Portelia 93
Potamethus 469
Potamilla 469
Potamis 471
pourtalesi, Sigalion 91
praecox, Amphitrite 419
    Sagitella 153
Prageria 128
Praxilla 410
Praxillela 410
Praxillura 409
Praxithea 202
Priarea 158
Prionognathus 339
Prionospio 368
proalopus, Onuphis 265
Proceraea 167
Procerastea 165
Prochaetoparia 101
Proclea 421
Proclymene 409
Proclymenini 409
producta, Laetmonice 82, 79
profundi, Glycera 350, 344
    Nicolea 429
    Travisia 387, 383
prolifer, Autolytus 170
prolifera, Syllis 324
prolifica, Phyllochaetopterus 364
Prolopadorhynchus 100, 119
Promenia 375
Protis 476
Protocarobia 108, 101
Protolaeospira 474
Protomystides 100
Protomystidinae 100
Protoplacostegus 476
Protothelepus 422
Protula 473
Protulides 469
Protulopsis 473
Psamathe 185

Psammate 185
Psammatolus 484
Psammolyce 90
Pseudocapitella 465
Pseudoclymene 409
pseudocorrugata, Dexiospira 478
Pseudohalosydna 38
Pseudomystides 99
Pseudonereis 227, 193, 195
Pseudonotophyllum 102
Pseudopotamilla 469
Pseudoscalibregma 390
Pseudosyllis 167
Psygmobranchus 473
Pterautolytus 165
pterocirri, Rhopalura 99
Pterocirrus 101
Pteroscolex 394
Pterosyllis 167
Pterothrix 325
puerilis, Ophryotrocha 339
pulchra, Lepidasthenia 36
punctata, Castalia 184
punctatus, Cirratulus 370
pupa, Travisia 389
purpuratus, Strongylocentrotus 396
pusilla, Janua 478
pycnobranchiata, Onuphis 295, 299
pycnocera, Rhynchonerella 147, 146
pygmaea, Bradophyla 396
Pygospio 368

quadrangularis, Pileolaria 478
quadraticeps, Globidoce 100
    Namanereis 196
    Phyllodoce 100
quatrefagesii, Chaetopterus 366
Quetieria 37
quinquemaculatus, Mylitta 410

racemosa, Paralaeospira 478
Ranzania 365
Ranzanides 365
regalis, Idanthyrsus 487
regnans, Eupolymnia 433
Reibischia 100
remex, Syllis 175
renalis, Nereis 213
renotubulata, Admetella 67
reptans, Terebellicola 420
Restio 85
reticulata, Hesione 188
    Terebella 421
retusoceps, Nainereis 355
reynaudii, Alciopa 130
    Halodora 139
    Nereis 213
Rhamphobrachium 264
Rhodine 409
Rhodininae 409
Rhodopsis 475
Rhopalosyllis 165, 177
Rhynchobolus 350
Rhynchonerella 146, 143, 130
robertianae, Armandiella 384
Robertianella 39
robustus, Cirratulus 379
Romanchella 475
roseum, Scalibregma 392
roseus, Oligobranchus 392
rostrata, Amphinome 27
rubricunda, Capitella 466
rubricundus, Notomastus 466
    Sandanis 466
rubripunctata, Bispira 471
rubrovittata, Dorvillea 343
rubrovittatus, Staurocephalus 339
rudolphi, Dorvillea 339
rugatus, Dexiospira 478
rutilans, Polynoe 35

Sabaco 410
Sabella 469
Sabellachares 468
Sabellaria 484
Sabellariidae 483, 23
Sabellastarte 469
Sabellidae 466, 23
Sabellides 455, 443
Sabellinae 468
Sacconereis 167
Sagitella 153, 152
Salmacina 475
Salmacinopsis 473
salmicidis, Euratella 469
Salvatoria 167
Samytha 444
Samythella 443
Samythinae 443
Samythopsis 444

sanctae vincentis, Phyllodoce 104
sancti josephi, Anaitides 103
Sandanis 466
Sangiria 25
Saphobranchia 397
sarsii, Chaetopterus 366
  Maldane 417
  Myxicola 468
  Sabella 468
saxicola, Eulalia 102
  Heterocirrus 382, 371
Scalibregma 391, 390
Scalibregmidae 389, 21
Scalis 463, 462
Scalisetosus 39
Schistocomus 443
Schizobranchia 469
Schizocraspedon 476
Schleirocheilus 391
Schmardanella 424
Schmardia 167
Scione 423
Scionella 421
Scionides 421
Scionopsis 423
Sclerocheilus 390
Sclerostyla 476
Scolecolepides 368
Scolecolipis 369
Scolelepis 368
Scoletoma 327
scolopendrina, Polynoe 420
Scoloplos 354
scoticus, Notocirrus 325
scutata, Sternaspis 404
Scyphoproctus 465
Sedentaria 383
segregata, Leodice 237, 232
segrex, Nereis 202
semidentata, Spirobella 478
Semiodera 397
septentrionalis, Tomopteris 159
sericoma, Pontogenia 84
Serpula 476
Serpulidae 472, 23
Serpuloidea 23
serrata, Pelagobia 122
sertularium, Rhabdostyla 420
setosa, Rhynchonerella 146
setossisima, Polynoe 365
setosus, Thelepus 420
sexhamata, Pallasia 489
sextentaculata, Nereis 381
sexungula, Pallasia 487
siciliensis, Eunice 236
  Leodice 236, 232
sicula, Hesione 189
Sigalion 91, 89
Sigalionidae 89, 19
Sigalioninae 89
Sige 100
similis, Pileolaria 478
simplex, Nans 125
  Plotobia 155
  Synelmis 177
sinincolens, Cirratulus 377
Sinistrella 475
Siphonostoma 398
Siphonostomum 398
Siphostoma 398
socia, Onuphis 284, 265
socialis, Phyllochaetopterus 364
solenotecton, Paronuphis 306, 264
sombreriana, Onuphis 264
Sonatsa 415, 409
Sonatsinae 409, 416
sordidum, Chloraema 398
Sosane 443
Sosanopsis 443
speciosa, Manayunkia 468
Spermosyllis 166
Sphaerodoce 100
Sphaerodoridae 182, 20
Sphaerodorum 182
Sphaerosyllis 166, 177
spinosus, Sternaspis 305
Spinther 25
Spintheridae 22
spinulosa, Sabellaria 484
Spio 368
Spiochaetopterus 365
Spionidae 367, 21
Spionides 368
Spionoidea 21
Spiophanes 368
Spiramella 479
spirillum, Circeis 478
Spirobranchus 474
Spirodiscus 474
Spiroglypha 479

Spiroglyphis 479
Spirographis 468
Spirorbella 474
Spirorbides 474
Spirorbinae 474
Spirorbis 474
spirorbis, Spirorbis 478
spirulaeformis, Stoa 479
splendens, Macrophyllum 101
splendida, Hesione 188
Staurocephalidae 339
Staurocephalus 339
Stauroceps 339
Stauronereis 339
Steggoa 100
Stephania 185
Stephanosyllis 167
Sternaspidae 404, 21
Sternaspis 405
Sthenelais 90
Sthenelanella 90
Sthenolepis 90
stigmatosa, Clymeneis 471
stimpsonis, Nereis 195
Stoa 479
Stratonice 227, 196
Streblosoma 422
Streblospio 368
Streptosyllis 165
striata, Hermodice 26
stricta, Hyalinoecia 317
strigiceps, Pomatoceros 480
strömi, Terebellides 324, 438
studeri, Vanadis 133
Styela 36
Stylarioides 397
subita, Uncinereis 216
Subprotula 473
swenanderi, Uncinaseta 326
Syllia 167
Syllidae 163, 23
Syllidea 183, 185
Syllides 165
Syllinae 165
Sylline 164
Syllis 174, 165
Sylloidea 22
Synelmis 176, 165
Synsyllis 165
taboguillae, Nicolea 425, 429
Tachytrpane 384
taenia, Eunice 236
takemoana, Paumotella 482
Taphus 185
tecton, Hyalinoecia 310
Tecturella 398
Telake 345, 344
Telamone 186
Teleonereis 339
Telepsavus 365
Telethusa 394
Telethusae 394
Telethusidae 394
telura, Oenone 335
tenuis, Corynocephalus 141
Petaloproctus 411
tenuissima, Phyllodoce 102
Protocarobia 102
Terebella 424, 421
terebellae, Crypsidomus 420
Terebellidae 418, 20
Terebellides 438, 422
Terebellidinae 422, 423
terebellidis, Haematocleptes 324
Terebellinae 420, 423
Terebelloidea 20
Terpsichore 385
tetraedra, Pleione 27
Tetraglene 167
Tetreres 490, 484
Thalanessa 91
thalassemoides, Sternaspis 405
Tharyx 372
Thelepella 422
Thelepides 422, 423
Thelepinae 423
Thelepodopsis 437
Thelepus 437, 422
Theodisca 355
Therochaeta 397
Thoe 166
Thoosa 202
thoracicus, Thelepus 420
Thoracophelia 384
Thormora 38
Thylaciphorus 167
Timarate 375
Tomopteridae 158, 19

Tomopteris 159
Torea 131, 130
torquens, Autolytus 172
Trachelophyllum 101
Tradopia 265
Travisia 387, 385
Travisiopsis 152
Tremastomastus 466
Triceratia 79
Trichobranchidae 422
Trichobranchidea 423
Trichobranchinae 422
Trichobranchus 422
Trichosyllis 174
Tricoelia 366
Trocoeliidae 366
tricornis, Spirobranchus 481
tricuspis, Pomatoceros 480
triloba, Euphrosyne 34
triqueter, Pomatoceros 473
Trophonia 397
Trypanosyllis 165
tubicola, Eunice 315
    Hyalinoecia 315, 314
    Leodice 315
    Nereidonta 315
    Nereis 315
    Northia 315
    Onuphis 315
tubifex, Euarche 85
tumulosa, Ophiura 325
Tyllorhynchus 194
Tylonereis 194
tympana, Eunomia 101
Typhlodrilus 152
Typhlonereis 195
Typhloscolecidae 151, 22
Typhloscolex 152
Typosyllis 174
Tyrrhena 190

Umbellisyllis 166
Uncinasetidae 20
uncinata, Siphonostoma 398
Uncinereis 215, 195
Uncinia 369
Unciniseta 326
Uncinisetidae 326
uncopalea, Amphicteis 448
Urosiphon 384

vagans, Amphinome 27, 24
    Pleione 27
vaginifera, Siphonostoma 398
vaginiferum, Siphonostomum 398
valencinii, Chaetopterus 366
valida, Leodora 478
Valla 466
valparaisensis, Maldanella 412
Vanadis 133, 130
variabilis, Spirorbis 478
variegata, Nereis 195
variopedata, Tricoelia 366
variopedatus, Chaetopterus 365
    Tricoelia 365
Venusia 437
venustula, Nicolea 419
vermicularis, Serpula 473
Vermilia 475
Vermiliopsis 475, 479
verruca, Sinistrella 478
verrucosa, Brada 399
    Nereis 213
versicolor, Lepidonotus 78
vertebralis, Liocapa 131
vexillaria, Onuphis 269, 274
viguieri, Lopadorrhynchus 114
    Pelagobia 122
villosa, Brada 396, 401
    Eucranta 40
vincenti, Branchiomaldane 393
violacea, Vanadis 133
violaceus, Paradexiospira 478
Virchowia 164
virchowii, Acicularia 153
viridis, Caulleriella 372
    Cirratulus 372
    Eulalia 99
    Leodice 230, 237
    Lycoris 213
viridissima, Eunonia 101
vitrea, Torea 131
vitreus, Spirorbides 478
vittata, Leodice 253
vittatus, Ophiodromus 185
volutacornis, Amphitrite 471
    Bispira 471
    Distylia 468

Vorticella 99
vulgaris, Myrus 166

Wartelia 419
Wawo 230
wyvillei, Laetmonice 82, 79

Xenia 35
Xenosyllis 165

yokahamiensis, Harmothoe 56

Zopyrus 479
Zorus 396
Zostera 35, 231, 408
Zygolobus 326
Zygophyllus 326

CORRIGENDA

Page	47	line	35	for	*nans*	read	*natans*
“	89	“	14	“	Eulepidinae	“	Eulepethinae
“	99	“	16	“	Natinae	“	Nantinae
“	264	“	21	“	310	“	306
“	269	“	35	“	*mannognathus*	“	*nannognathus*
“	324	“	37	“	*Labidognothus*	“	*Labidognathus*
“	326	“	24	“	*fonensis*	“	*fouensis*
“	368	“	43	“	Morants	“	Moranis
“	370	“	4	“	Paecilochaetus	“	Poecilochaetus
“	391	“	32	“	Liphobranchus	“	Liphobranchius
“	405	“	30	“	*major*	“	*maior*
“	420	“	4	“	Noimia	“	Loimia
“	422	“	24	“	Parathelpus	“	Parathelepus
“	443	“	12	“	Amphictius	“	Amphicteis
“	467	“	4	“	Caobangeinae	“	Caobangiiniae

EXPLANATION OF THE PLATES.

PLATE 1.

PLATE 1.

Harmothoe mexicana Chamberlin.

Figures 1–9.

1.— Anterior end, dorsal view (style of median tentacle broken off; tentacular cirri in outline). × 27.
2.— Twenty second right parapodium, caudal view. × 18.
3.— First elytron. × 21.
4.— Small portion of same elytron. × 187.
5.— Neuropodial seta, common form. × 108.
6.— Neuropodial seta, second form. × 108.
7.— Small portion of neuropodial seta, common form, viewed from edge. × 1073.
8.— The same, viewed from side. × 1073.
9.— Notopodial seta, distal portion, side view. × 63.

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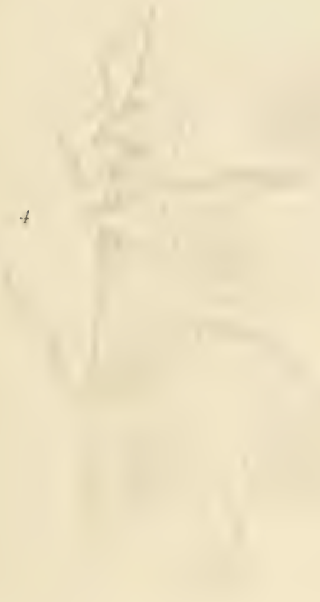

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PLATE 2.

PLATE 2.

Harmothoe mexicana Chamberlin.

Figure 1.

1.— Neuropodial seta of most ventral row. × 412.

Harmothoe hirsuta Johnson.

Figures 2–8.

2.— Prostomium, dorsal view (right palpus and style of median tentacle missing). Setae of peristomial parapodium shown on left side. × 64.
3.— Portion of a dorsal cirrus proximad of middle, in outline. × 281.
4.— Notopodial seta, ordinary form. × 435.
5.— Notopodial seta, stouter intermediate form. × 435.
6.— Notopodial seta, short form. × 435.
7.— Neuropodial seta, longer form, distal portion. × 435.
8.— Neuropodial seta, shorter form, distal portion. × 435.

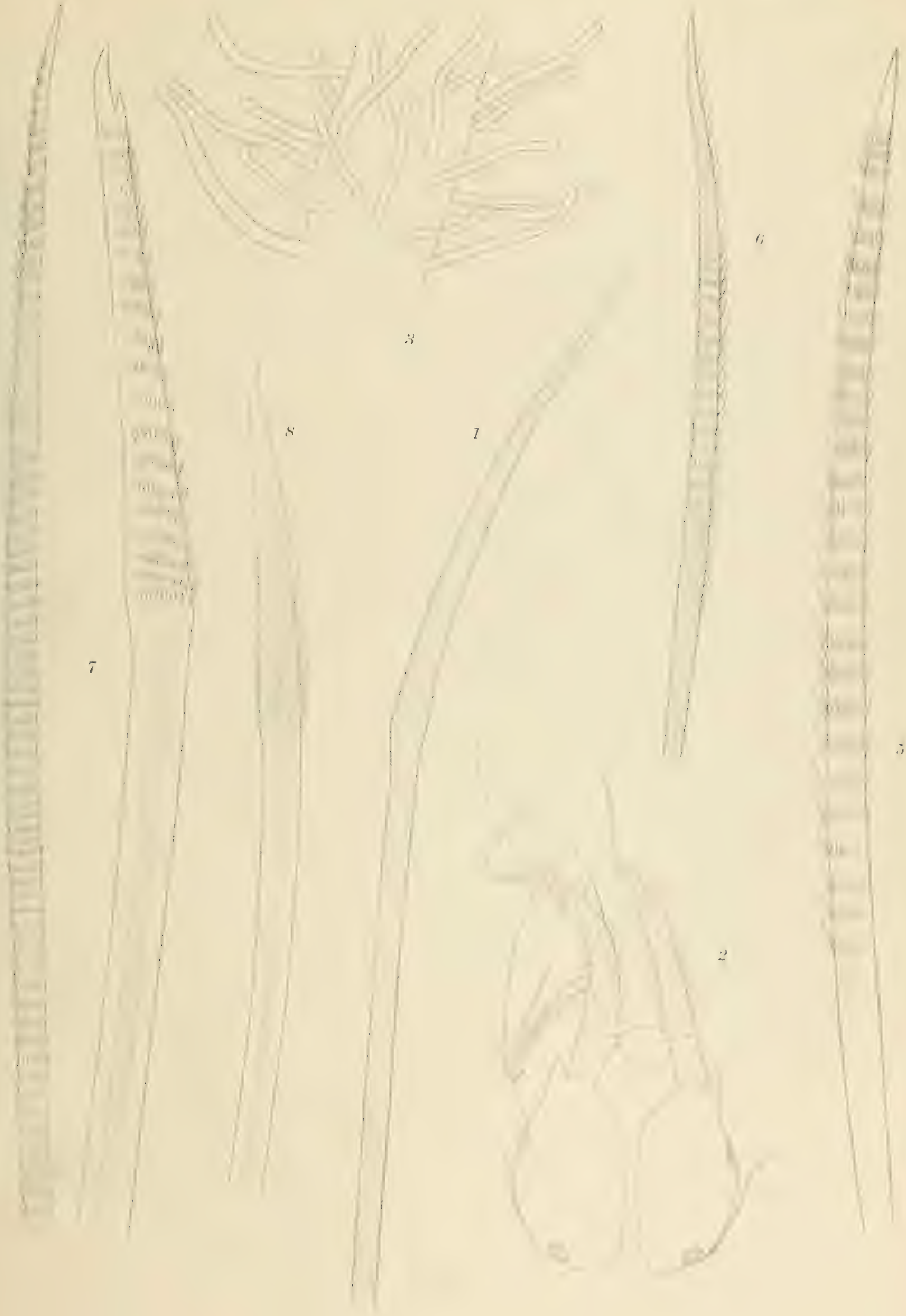


PLATE 3.

PLATE 3.

Harmothoe hirsuta Johnson.

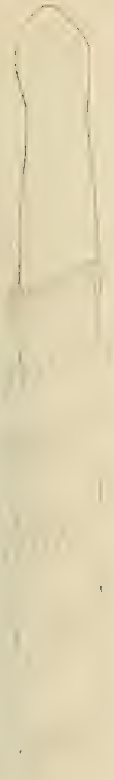
Figure 1.

1.— Small portion from middle of notopodial seta. × 1073.

Eunoe eura Chamberlin.

Figures 2-6.

2.— Anterior end, dorsal view. × 17.
3.— Cilia of a dorsal cirrus. × 280.
4.— Distal half of neuropodial seta. × 93.
5.— Tip of neuropodial seta of thirteenth somite. × 1050.
6.— Tip of notopodial seta of thirteenth somite. × 1050.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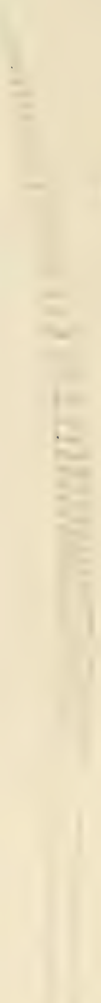
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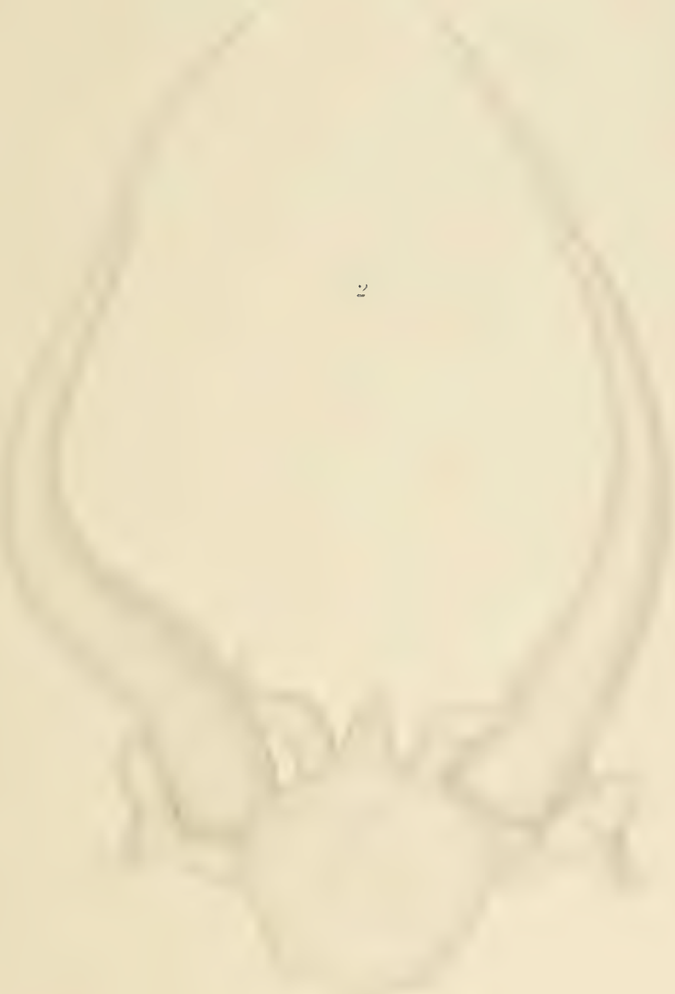
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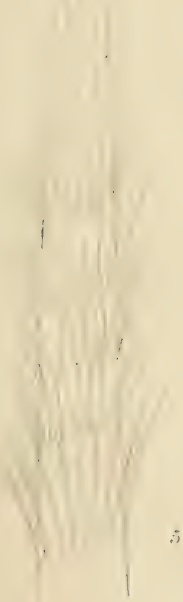
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PLATE 4.

PLATE 4.

Lepidonotus nesophilus Chamberlin.

Figures 1–7.

1.— Anterior end, dorsal view (first right palpus and first setigerous parapodium and left parapodium of peristomium omitted). × 30.
2.— First elytron. × 20.
3.— Left tenth elytron. × 20.
4.— Large tubercle of first elytron. × 298.
5.— Smaller tubercles of first elytron. × 298.
6.— Rod from margin of elytron I. × 1232.
7.— Part of principal notopodial seta toward tip. × 1232.

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PLATE 5.

PLATE 5.

Lepidonotus nesophilus CHAMBERLIN.

Figures 1–3.

1.— Notopodial seta from anterior region. × 278.
2.— Neuropodial seta from anterior region. × 278.
3.— Neuropodial seta from posterior region. × 278.

Lepidasthenia curta CHAMBERLIN.

Figures 4–9.

4.— Anterior end, dorsal view. × 27.
5.— First elytron. × 27.
6.— Elytron from near forty sixth somite. × 27.
7.— Slender neuropodial seta, distal end, from fourteenth somite. × 284.
8.— Neuropodial seta, typical form, from twenty first somite. × 284.
9.— Neuropodial seta, intermediate form, from fourteenth somite. × 284.

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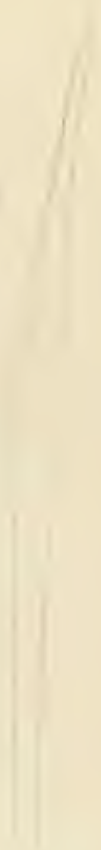

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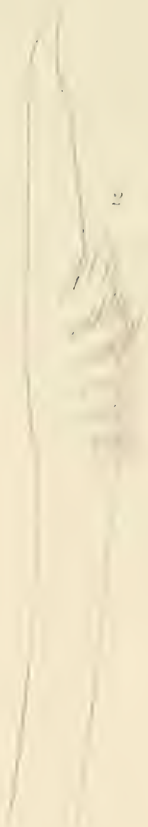

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PLATE 6.

PLATE 6.

Harmopsides natans Chamberlin.

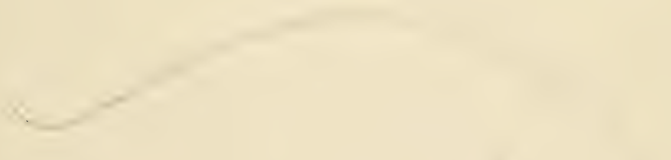
Figures 1–5.

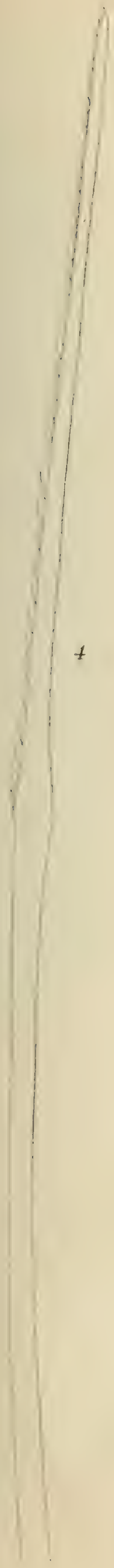
1.— Anterior end, dorsal view. × 27.
2.— Proboscis, ventral view (Paratype, Sta. 4675). × 27.
3.— Dorsal neuropodial seta, distal portion. × 281.
4.— Dorsal neuropodial seta, intermediate form, distal portion. × 281.
5.— Ventral neuropodial seta, distal portion. × 281.

Podarmus ploa Chamberlin.

Figure 6.

6.— Distal portion or head of dorsal neuropodial seta. × 1087.

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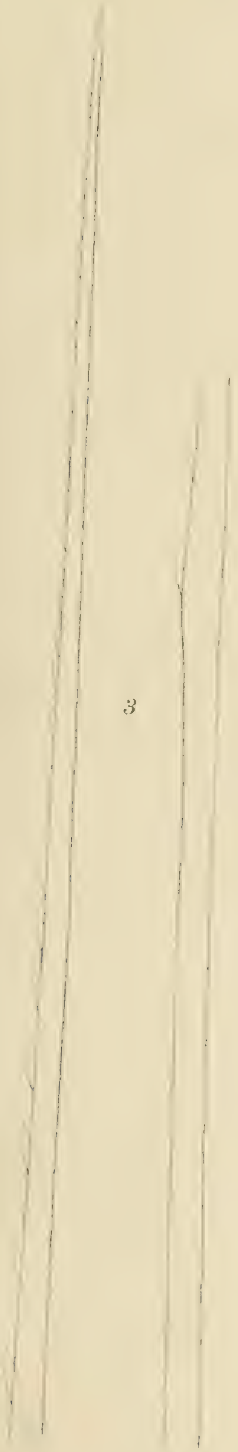
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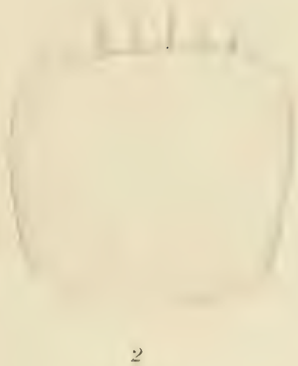
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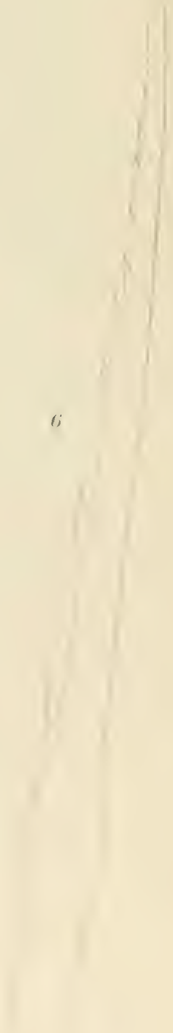
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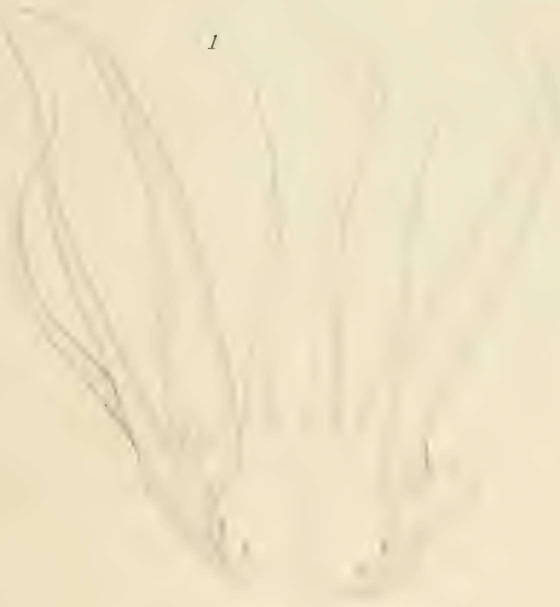
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PLATE 7

PLATE 7.

Podarmus ploa CHAMBERLIN.

Figures 1, 2.

1.— Ventral neuropodial seta, tip, side view. × 1075.
2.— The same, viewed from edge. × 1075.

Plotolepis nans CHAMBERLIN.

Figures 3, 4.

3.— Anterior region, dorsal view (all elytra and the notocirri of the sixth somite missing; setae of some of parapodia not shown). × 45.
4.— Ventral seta, distal portion. × 407.

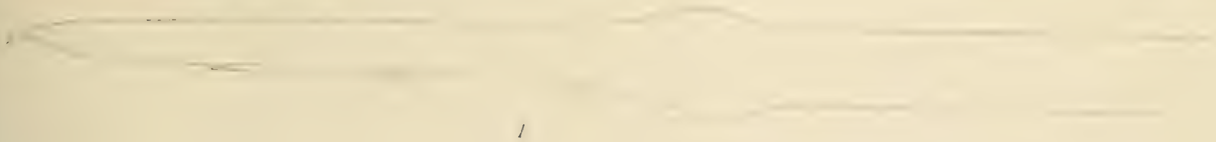
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PLATE 8.

PLATE 8.

Polynoe innatans Chamberlin.

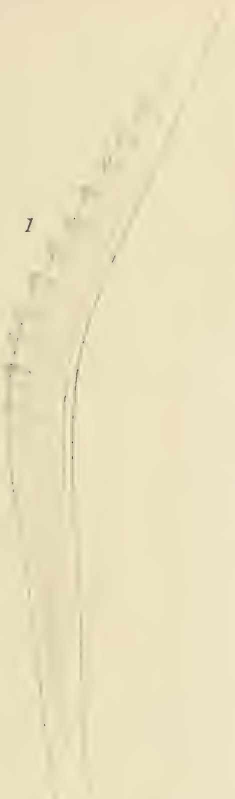
Figures 1–7.

1.— Anterior notopodial seta, free portion. × 430.
2.— Notopodial seta, intermediate type, from eighth somite, distal portion. × 430.
3.— Portion of notopodial seta of intermediate type from the eighth somite, viewed more from the convex pectinated edge. × 1075.
4.— Portion of notopodial seta of third type from eighth somite. × 1075.
5.— Shorter form of neuropodial seta, distal portion, from seventh somite. × 430.
6.— Larger form of neuropodial seta from sixth somite, distal portion. × 430.
7.— The same viewed from the edge. × 430.

Polynoe nesiotes Chamberlin.

Figure 8.

8.— Neuropodial seta. × 430.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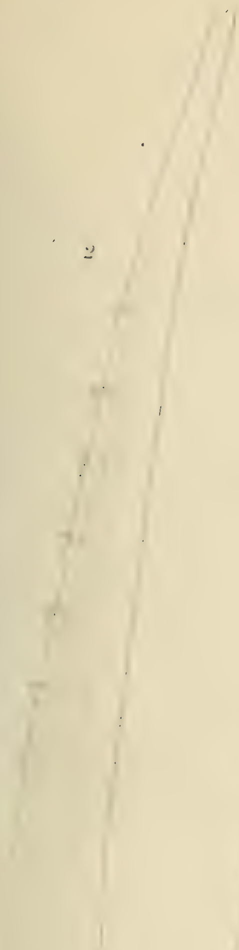
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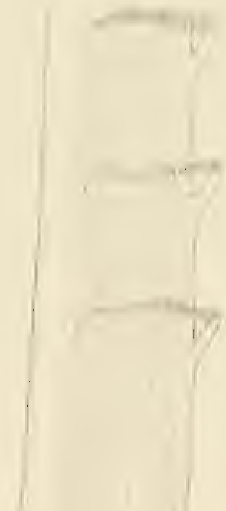
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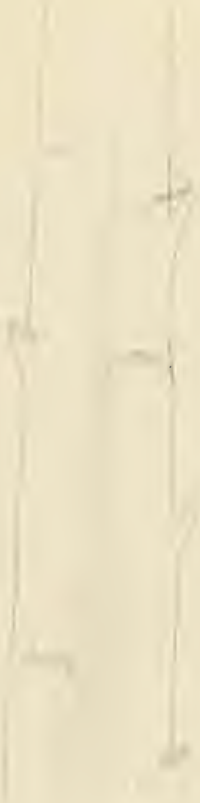
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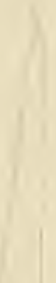
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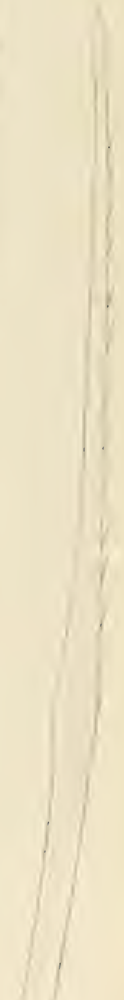
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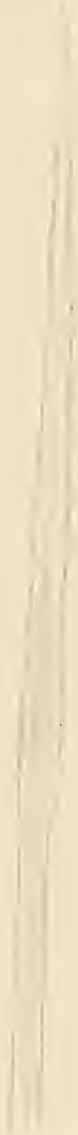
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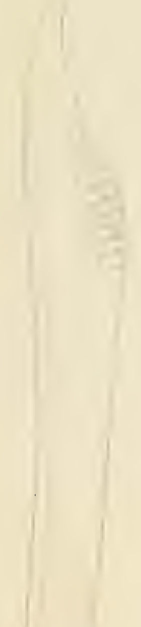
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PLATE 9.

PLATE 9.

Polynoe nesiotes Chamberlin.

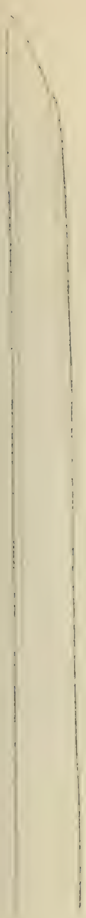
Figures 1–5.

1.— Proximal part of pectinate division of a ventral seta. × 1075.
2.— The two most distal pectinae of the same seta. × 1075.
3.— Elytron from middle region of body. × 27.
4.— First elytron. × 27.
5.— Second elytron. × 27.

Admetella hastigerens Chamberlin.

Figures 6–8.

6.— Prostomium and appendages, dorsal view (tentacles broken off). × 16.
7.— Neuropodial seta, exposed portion, viewed from side. × 104.
8.— The same, viewed from edge. × 104.



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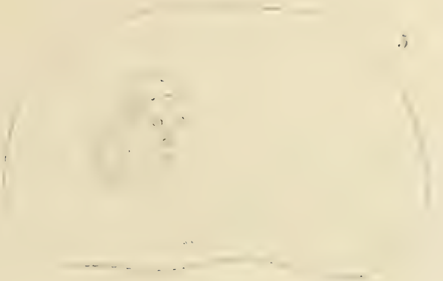

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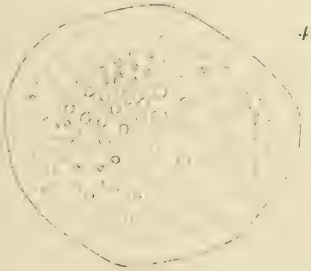

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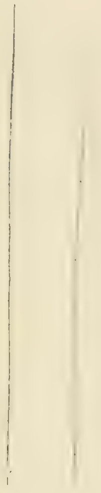

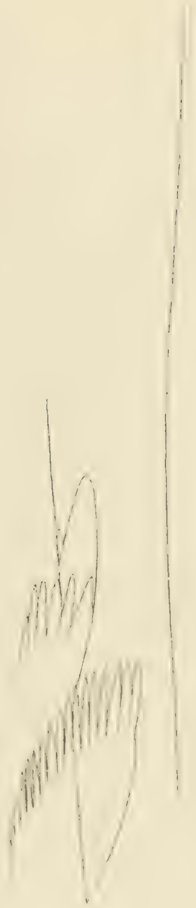

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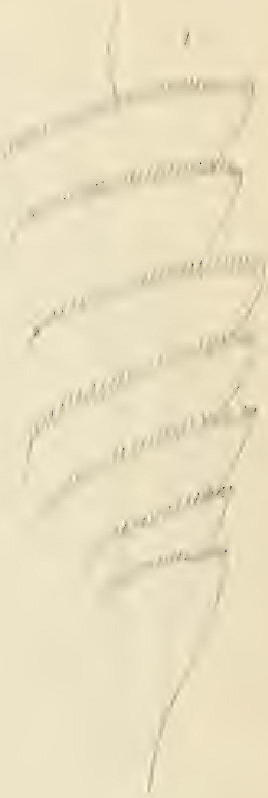

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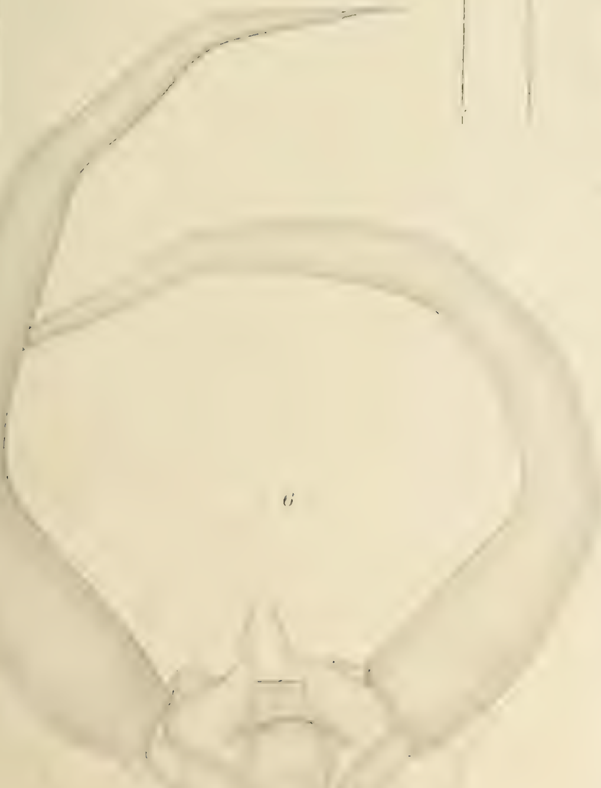

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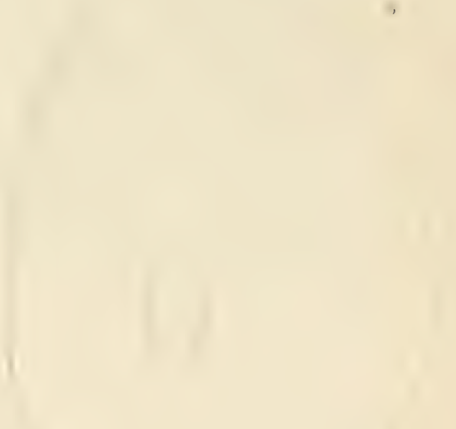

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PLATE 10

PLATE **10**.

Admetella dolichopus Chamberlin.

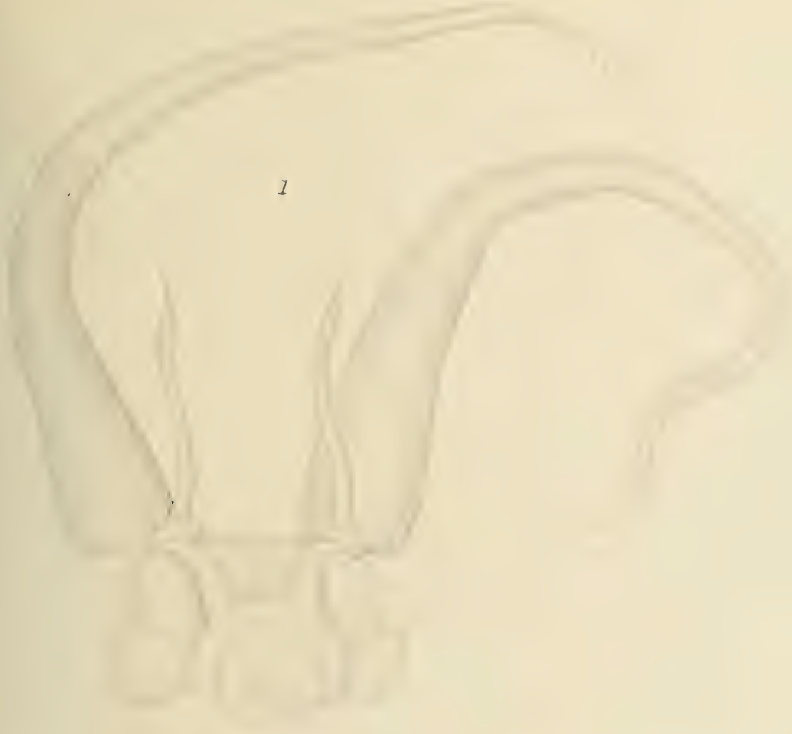
Figure 1.

1.— Prostomium and appendages (median tentacle broken off). × 16.

Pontogenia curva Chamberlin.

Figures 2–7.

2.— Eighth right parapodium, caudal view. × 63.
3.— One of the smaller notopodial setae. × 63.
4.— Tip of coarser ventral seta. × 281.
5.— Exposed portion of slender type of anterior parapodium. × 63.
6.— Distal portion of fine ventral seta of anterior parapodium. × 281.
7.— Smaller seta of ventral fascicle of anterior parapodium. × 281.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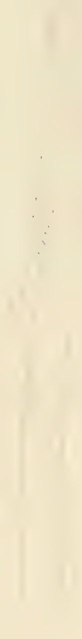
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PLATE 11.

PLATE 11.

Pontogenia curva Chamberlin.

Figures 1, 2.

1.— Distal end of more slender ventral seta from middle region of body. × 281.
2.— Beginning of serrate portion of fine bristle of anterior region showing teeth. × 1075.

Laetmonice wyvillei McIntosh.

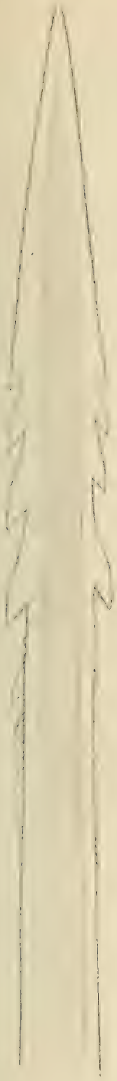
Figure 3.

3.— Distal end of dorsal seta showing supplementary teeth below main series (Sta. 4675). × 189.

Panthalis panamensis Chamberlin.

Figures 4–8.

4.— Anterior end, dorsal view, showing protruded proboscis (left elytra in outline; first two right elytra removed). × 18.
5.— Tip of ventral seta of second setigerous somite. × 415.
6.— Distal end of median seta, second setigerous somite. × 281.
7.— Distal end of dorsal seta, extreme apex broken off. × 1036.
8.— Distal end of finer dorsal seta. × 1036.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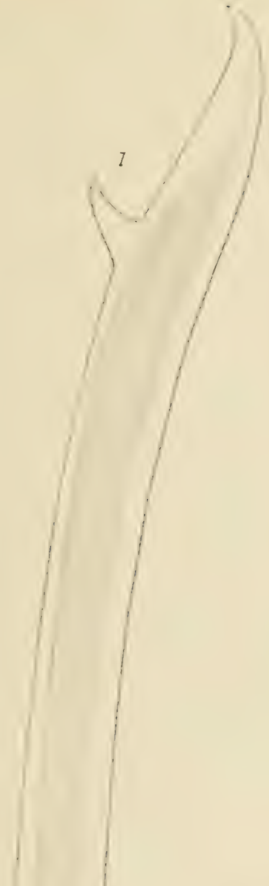
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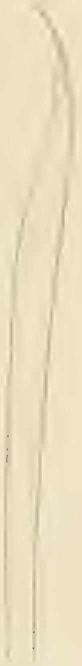
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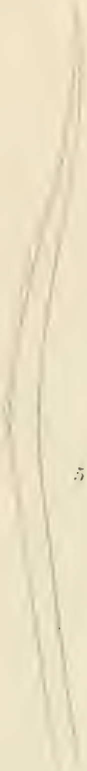
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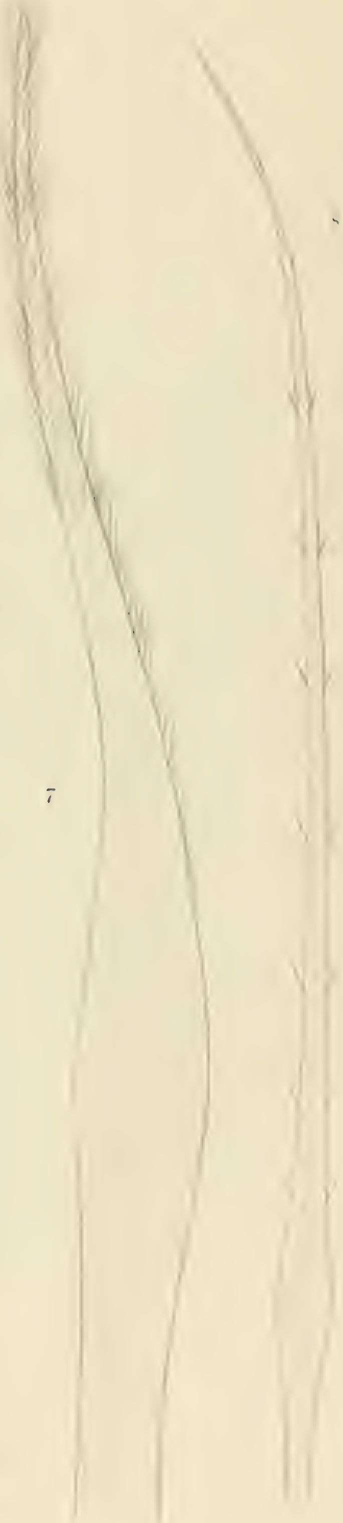
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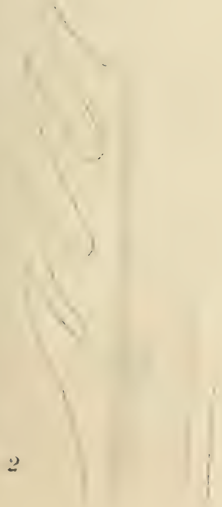
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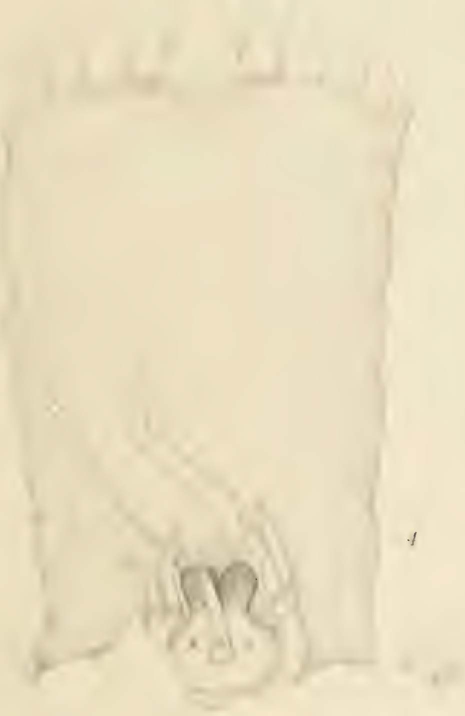
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PLATE 12.

PLATE 12.

Panthalis panamensis CHAMBERLIN.

Figures 1–6.

1.— Median seta, distal end, first setigerous parapodium. × 530.
2.— Ventral seta, distal end. × 500.
3.— Small of median series. × 326.
4.— Ordinary type of seta of median series (filament missing). × 31.
5.— Elytron from near thirtieth somite. × 31.
6.— First right elytron.

Euphrosyne panamica CHAMBERLIN.

Figures 7, 8.

7.— Dorsal seta, second type. × 326.
8.— Tip of larger form of ventral seta. × 326.

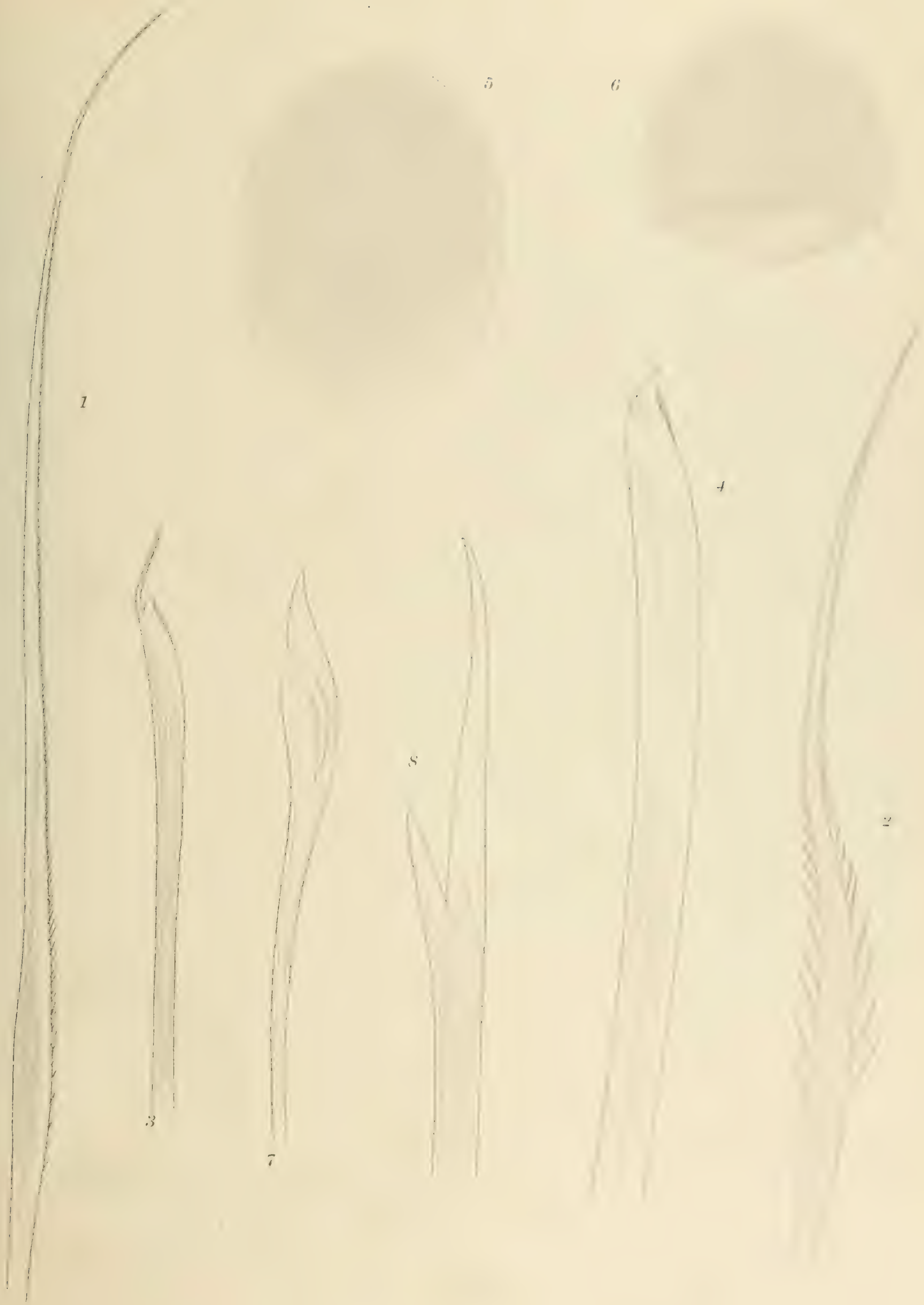

PLATE 13.

PLATE 13.

Euphrosyne panamica Chamberlin.

Figures 1-7.

1.— Dorsal clavate seta, distal end, showing the lower lobe in frontal view seen by transmitted light, the other lobe in dotted outline. × 1022.
2.— Dorsal clavate seta, distal end, viewed from cleft edge. × 1022.
3.— Dorsal seta, distal end. × 277.
4.— Smaller dorsal seta. × 277.
5.— A ventral seta. × 277.
6.— A small ventral seta, distal end. × 277.
7.— A branchia from posterior region. × 62.

Chloeia entypa Chamberlin.

Figures 8, 9.

8.— Distal end of dorsal seta of anterior region of body. × 277.
9.— Distal end of ventral seta of middle region. × 277.

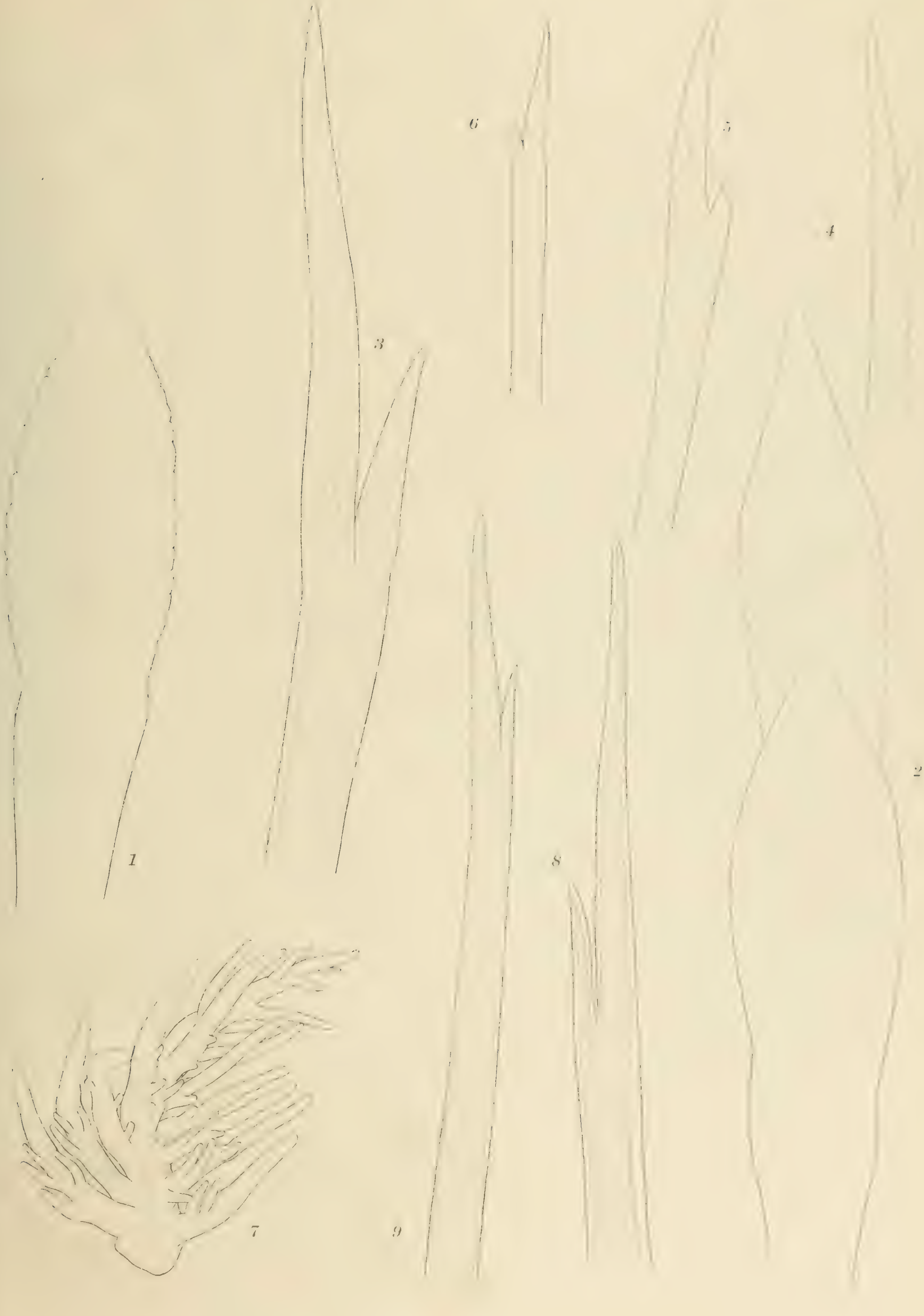

PLATE 14.

PLATE 14.

Chloeia entypa Chamberlin.

Figures 1, 2.

1.— Serrulate dorsal seta, distal part, from middle region of body. × 281.
2.— Non-serrulate dorsal seta from same fascicle as preceding, view not completely from side. × 281.

Eurythoe complanata (Pallas).

Figures 3–9.

3.— Tip of ventral seta from large specimen from the Galapagos Islands. × 281.
4.— Same, from a second, smaller, specimen from the Galapagos Islands. × 281.
5.— Same, from specimen from the Tortugas. × 281.
6.— Same, from specimen from Fakarava. × 281.
7.— Same, from second specimen from Fakarava. × 281.
8.— Same, from young specimen from Papeete. × 281.
9.— Same, from specimen from Easter Island. × 281.

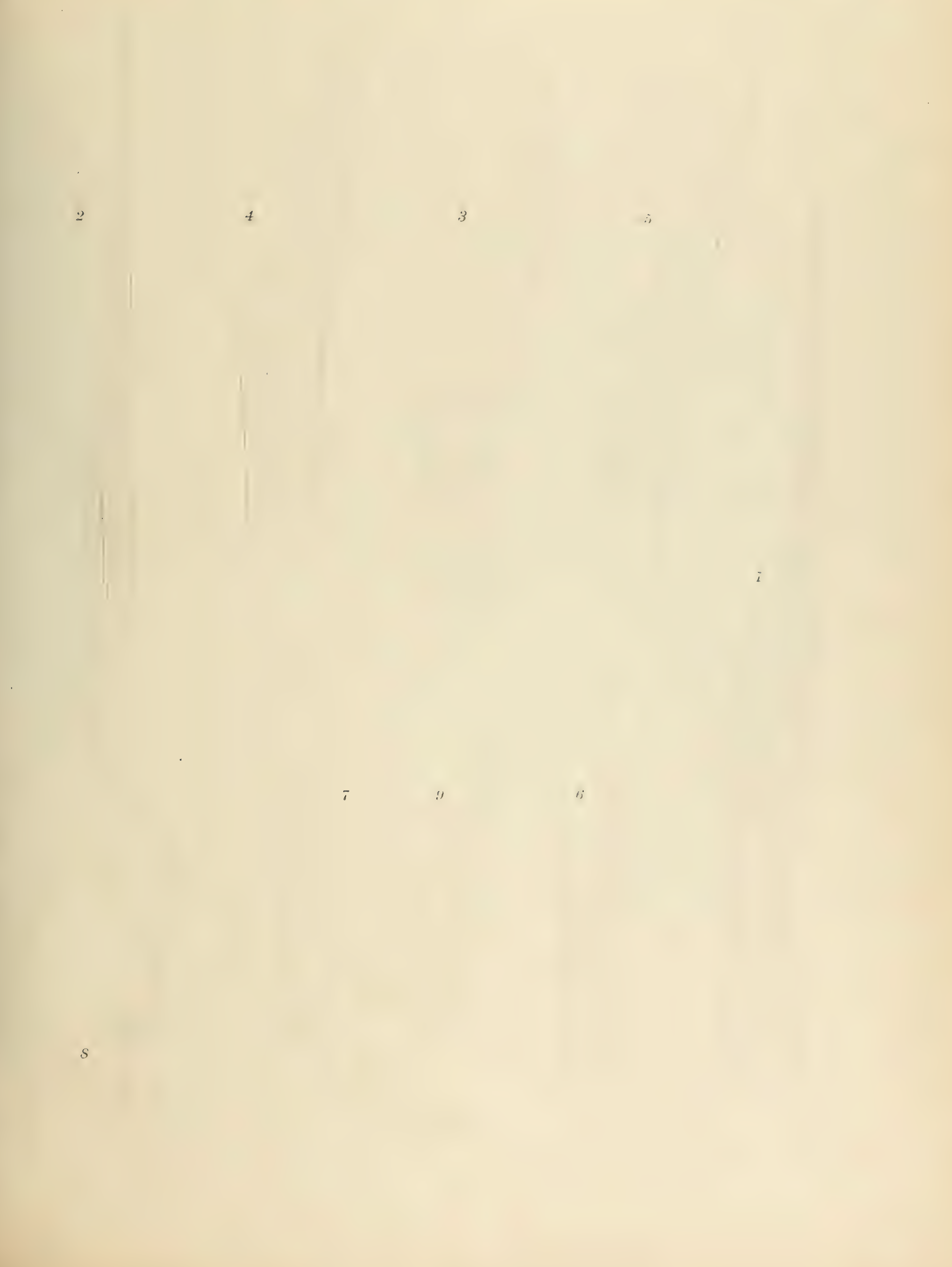
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PLATE 15.

PLATE 15.

Nepthys ectopa Chamberlin.

Figures 1–7.

1.— Anterior region, dorsal view. × 13.5.
2.— Proboscis, distal view. × 13.5.
3.— Right thirty eighth parapodium, anterior view. × 63.
4.— Finer anterior neuropodial seta, exposed portion. × 408.
5.— Principal type of neuropodial seta, smaller form. × 408.
6.— Principal type of neuropodial seta, common form. × 408.
7.— Notopodial aciculum, distal portion. × 408.

Anaitides compsa Chamberlin.

Figures 8, 9.

8.— Distal end of seta. × 281.
9.— Second setigerous parapodium. × 18.

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PLATE 16.

PLATE 16.

Anaitides compsa Chamberlin.

Figures 1–6.

1.— Second setigerous parapodium, notocirrus separate. × 18.
2.— Fourth setigerous parapodium. × 18.
3.— Eleventh setigerous parapodium, anterior view. × 18.
4.— Fortieth setigerous parapodium, caudal view. × 18.
5.— Parapodium from middle region of body. × 18.
6.— Parapodium about thirty somites from caudal end. × 18.

Phyllodoce fakaravana Chamberlin.

Figures 7-12.

7.— Prostomium, dorsal view. × 27.
8.— Style of notocirrus of second setigerous parapodium. × 27.
9.— Third setigerous parapodium, caudal view. × 27.
10.— Parapodium from posterior middle region. × 27.
11.— Parapodium from about seventieth somite, anterior view. × 27.
12.— Seta, distal portion. × 429.

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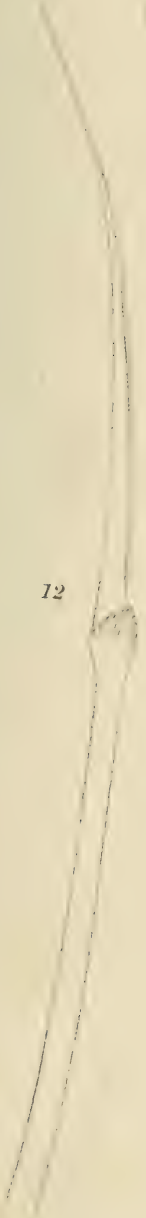

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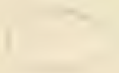

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PLATE 17.

PLATE **17**.

Lopadorrhynchus nans CHAMBERLIN.

Figures 1-5.

1.— Parapodium from middle region. × 45.
2.— Compound seta, distal end, from middle region of body. × 281.
3.— Simple ventral seta, tip, from middle region of body. × 281.
4.— Distal end of shaft of compound seta, viewed from edge, from middle region of body. × 1110.
5.— Side view of the same. × 1110.

Lopadorrhynchus parvum CHAMBERLIN.

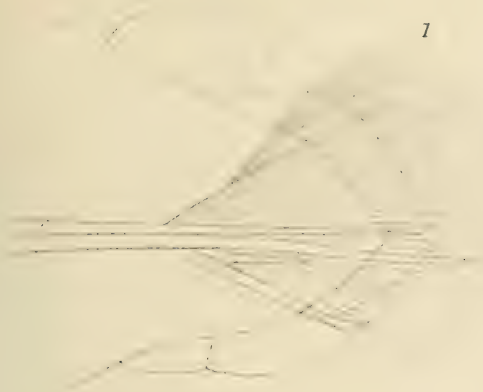
Figures 6, 7.

6.— Seventh left parapodium. × 63.
7.— Compound seta, seventh parapodium. × 281.

Mastigethus errans CHAMBERLIN.

Figures 8, 9.

8.— Anterior region, dorsal view. × 27.
9.— Proboscis, ventral view. × 27.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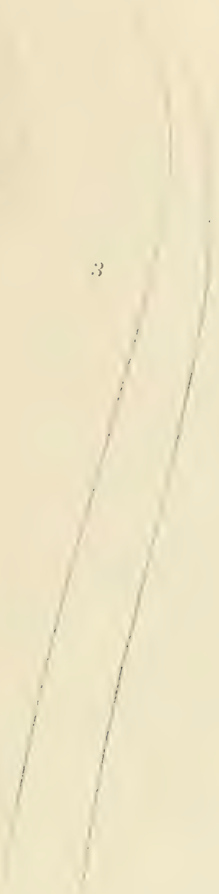
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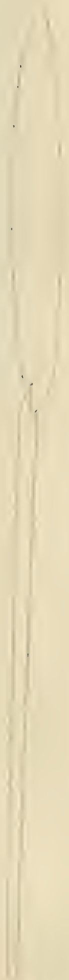
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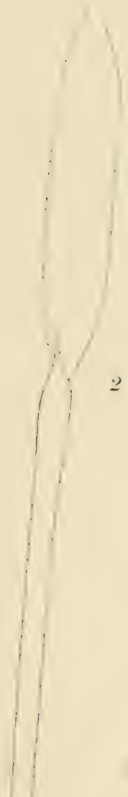
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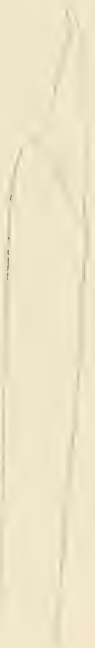
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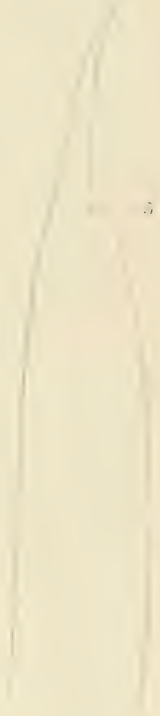
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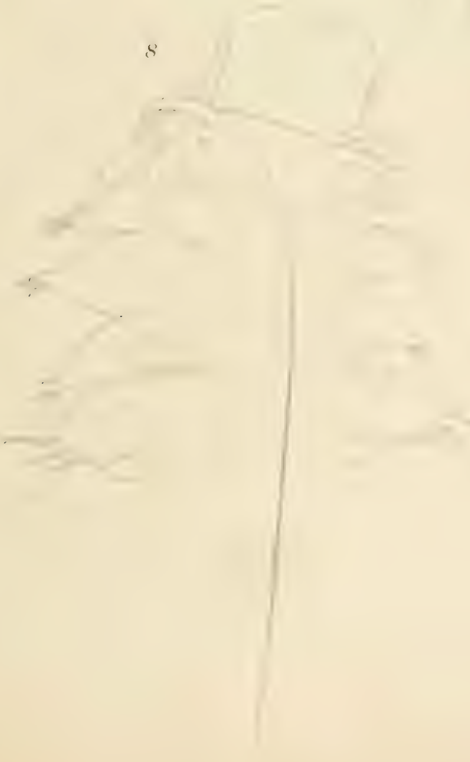
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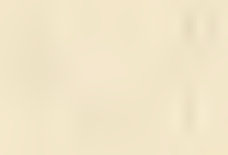
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PLATE 18.

PLATE 18.

Mastigethus errans Chamberlin.

Figures 1–6.

1.— Parapodium of middle region, caudal view. × 45.
2.— Distal end and socket of compound seta, side view. × 1110.
3.— The same, frontal view. × 1110.
4.— Simple ventral seta, distal end, from middle region of body. × 281.
5.— Distal end of compound seta. × 281.
6.— Aciculum, distal and proximal ends. × 281.

Nans simplex Chamberlin.

Figures 7, 8.

7.— Distal portion of ventral seta, larger form, from middle region of body. × 1075.
8.— The same, smaller form of same parapodium. × 1075.

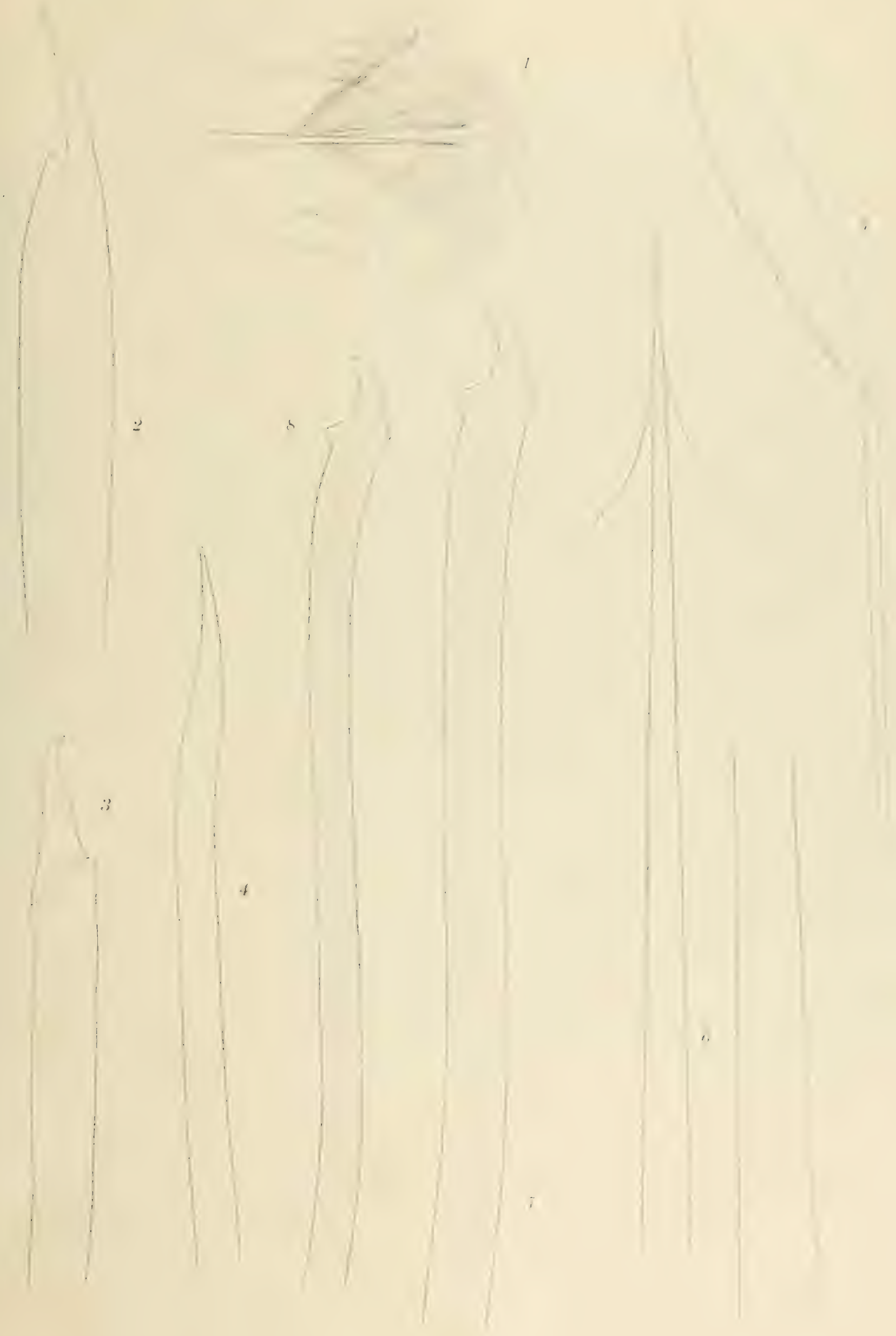


PLATE 19.

PLATE 19.

Nans simplex Chamberlin.

Figures 1–4.

1.— Anterior region, dorsal view (upper tentacular cirri and lower tentacles missing). × 64.
2.— Posterior region, dorsal view (most of the cirri missing). × 64.
3.— Tip of notopodial aciculum. × 1075.
4.— Distal portion of notopodial seta, view of broader surface. × 1075.

Autolytus torquens Chamberlin.

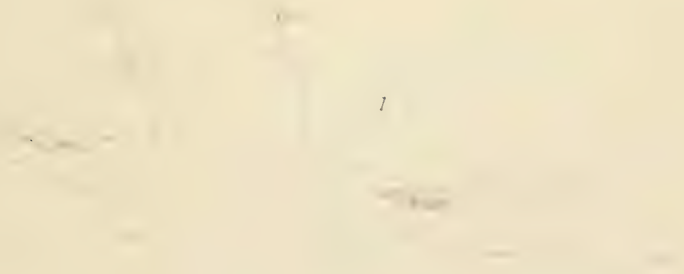
Figures 5–7.

5.— Anterior parapodium. × 64.
6.— Parapodium from middle region of body. × 64.
7.— Composite seta from anterior parapodium. × 1637.

Autolytus obliquatus Chamberlin.

Figure 8.

8.— Third setigerous parapodium. × 64.



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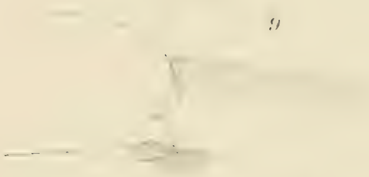

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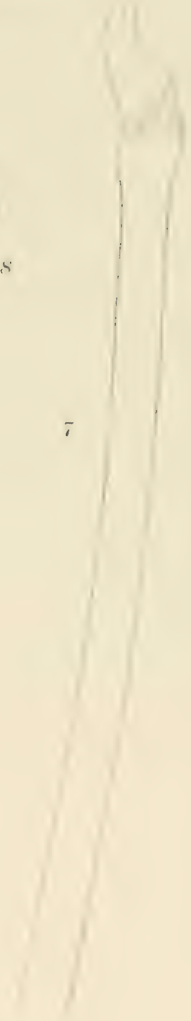

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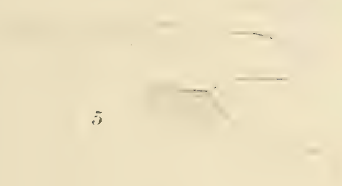

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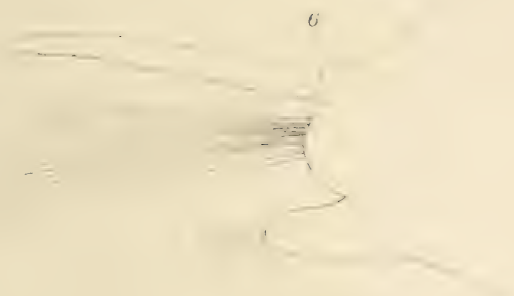

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PLATE 20.

PLATE 20.

Autolytus obliquatus Chamberlin (pelagic male).

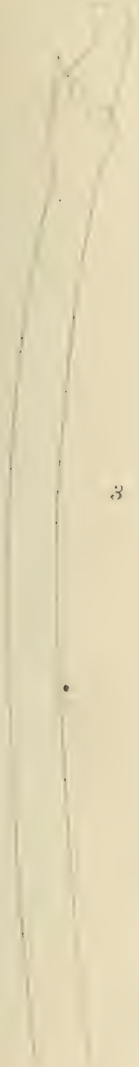
Figures 1-3.

1.— Anterior region, dorsal view. × 63.
2.— Anterior region, ventral view. × 63.
3.— Compound seta. × 1637.

Autolytus planipalpus Chamberlin (pelagic male).

Figure 4.

4.— Fourth left parapodium of second division (eighteenth setigerous). × 63.



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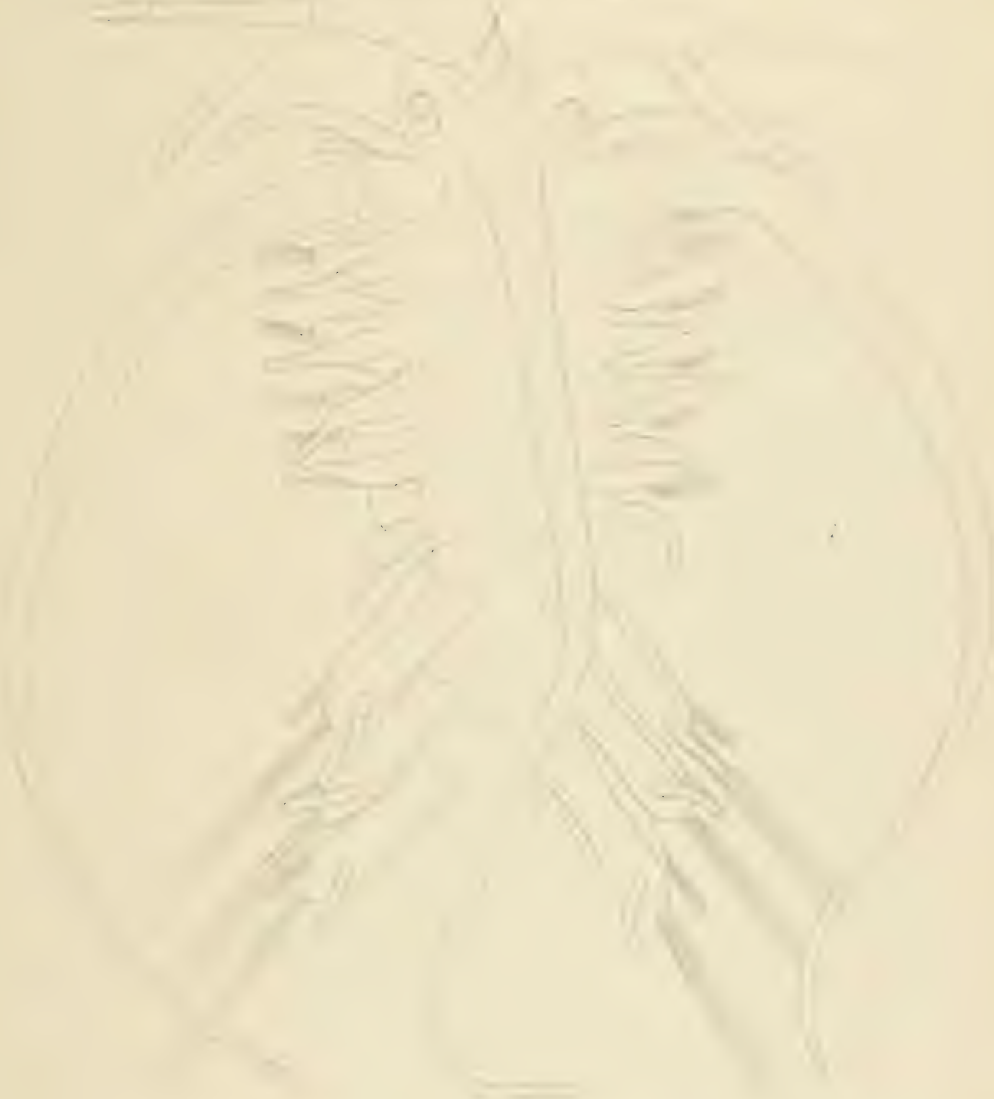

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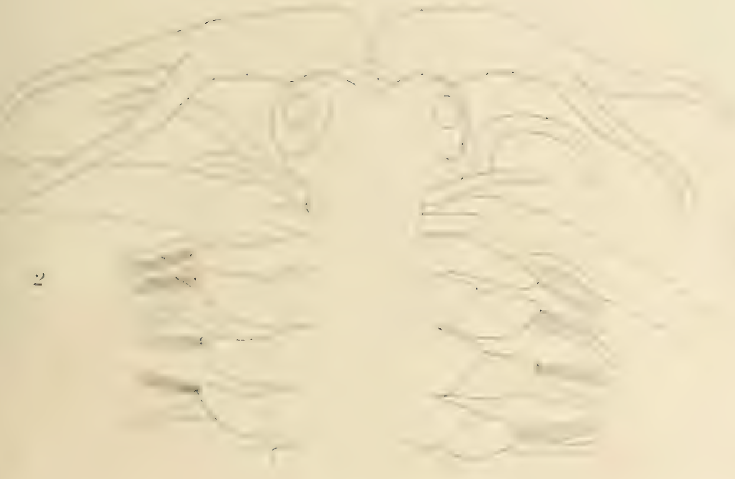

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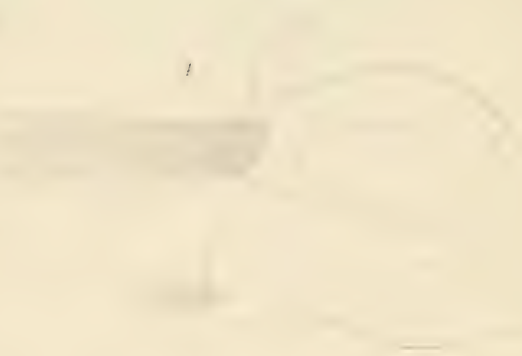

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PLATE 21.

PLATE 21.

Autolytus planipalpus Chamberlin (pelagic male).

Figures 1, 2.

1.— Anterior end and appendages. × 63.
2.— Composite setae, middle region of body. × 1637.

Odontosyllis atypica Chamberlin.

Figures 3, 4.

3.— Compound seta, distal end. × 1637.
4.— Parapodium from middle region of body, anterior view. × 63.

Syllis remex Chamberlin.

Figure 5.

5.— Parapodium from middle region of body, caudal view, with notocirrus broken off. × 27.

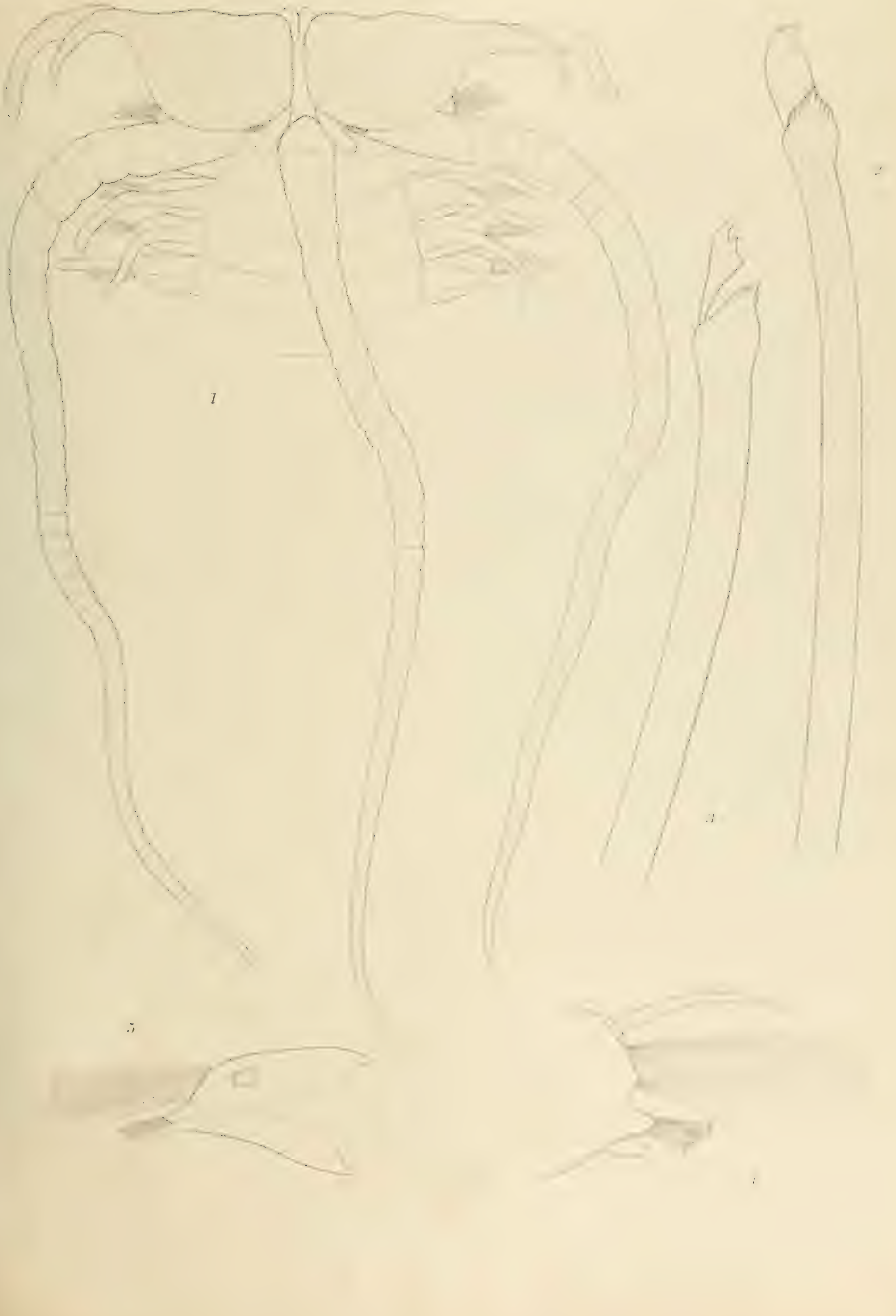


PLATE 22.

PLATE 22.

Odontosyllis atypica Chamberlin.

Figures 1–3.

1.— Anterior end of body with appendages, dorsal view. × 63.
2.— Lateral view of eyes of male. × 63.
3.— Lateral view of eyes of female. × 63.

Syllis remex Chamberlin.

Figures 4–6.

4.— Composite seta, distal end. × 1075.
5.— Dorsal seta, distal end, side view. × 1075.
6.— Notopodial aciculum, distal end. × 1075.

Hesione genetta Grube.

Figures 7, 8.

7.— Composite seta, distal end. × 281.
8.— Composite seta, distal end of blade, from sixth parapodium. × 1140.

Hesione panamica Chamberlin.

Figures 9, 10.

9.— Composite seta from eighth parapodium, distal end. × 281.
10.— Tip of same. × 1140.

Hesione splendida Savigny.

Figures 11, 12.

11.— Composite seta from eighth parapodium, distal end. From Mediterranean Sea. × 281.
12.— Tip of same. × 1140.

Hesione reticulata Marenzeller.

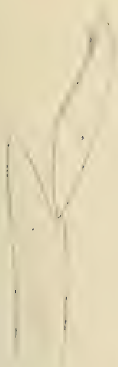
Figure 13.

13.— Tip of composite seta (enlarged from figure by Marenzeller). × 1110.

Hesione ehlersi Gravier.

Figure 14.

14.— Tip of composite seta (enlarged from figure by Gravier). × 1050.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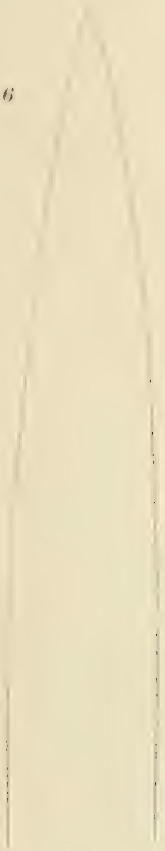
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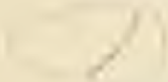
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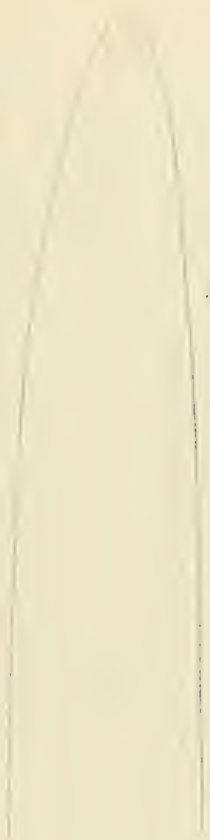
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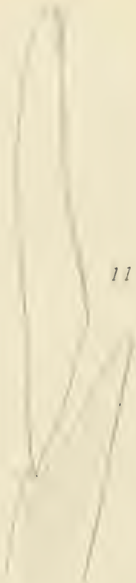
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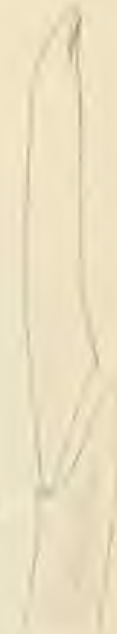
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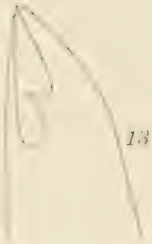
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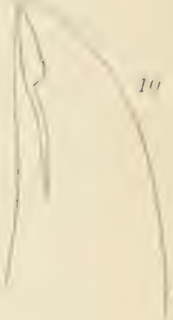
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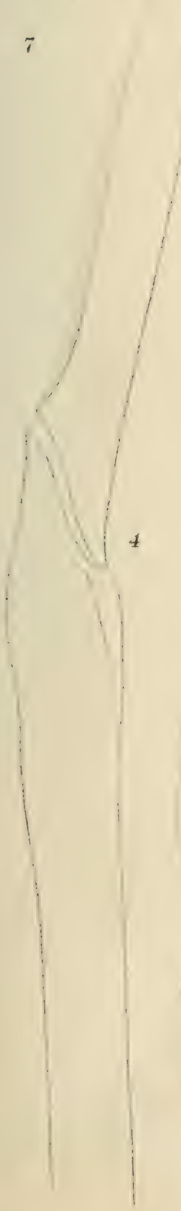
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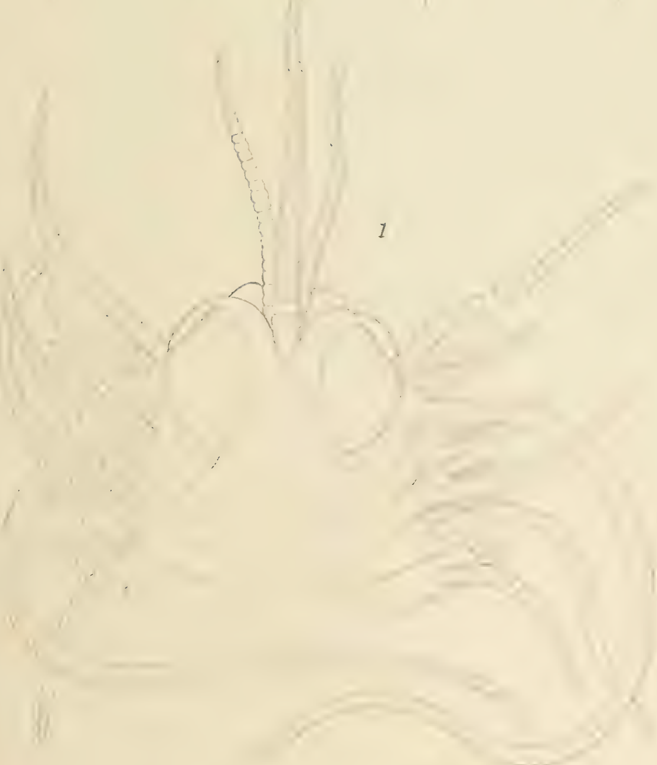
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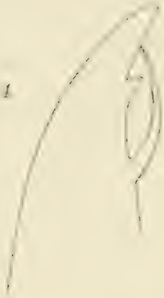
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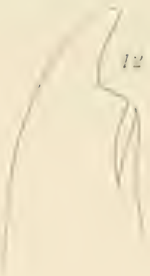
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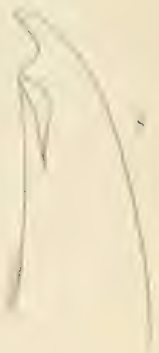


PLATE 23.

PLATE 23.

Corynocephalus paumotanus CHAMBERLIN.

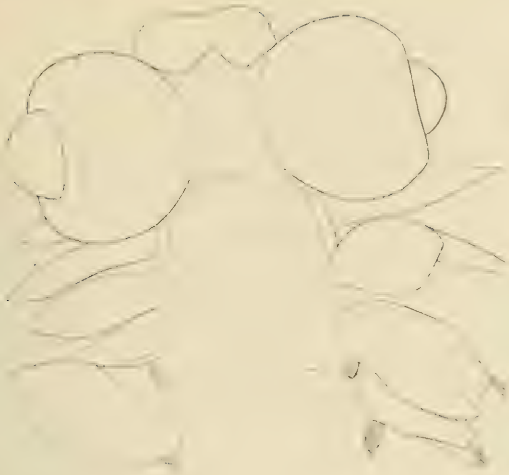
Figures 1–3.

1.— Anterior end, dorsal view. × 27.
2.— Anterior end, ventral view. × 27.
3.— Parapodium of twentieth somite, anterior view. × 27.

Plotohelmis alata CHAMBERLIN.

Figures 4–10.

4.— Prostomium, dorsal view. × 27.
5.— Anterior end, ventral view. × 27.
6.— Parapodium from middle region of body. × 63.
7.— Notocirrus of third (or fourth) parapodium. × 63.
8.— Notocirrus of fourth (or fifth) parapodium. × 63.
9.— Notocirrus of sixth parapodium. × 63.
10.— Notocirrus of twelfth parapodium. × 63.



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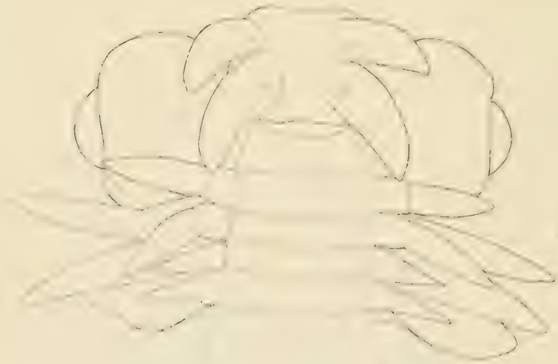

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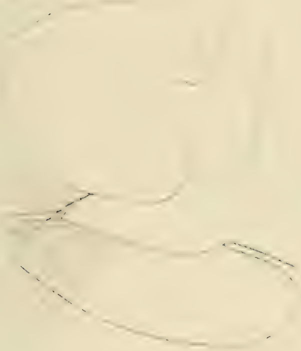

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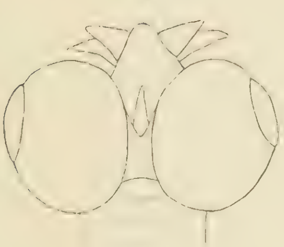

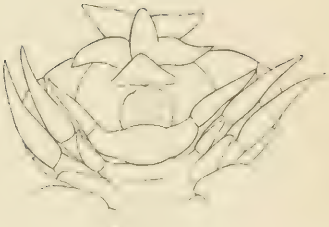

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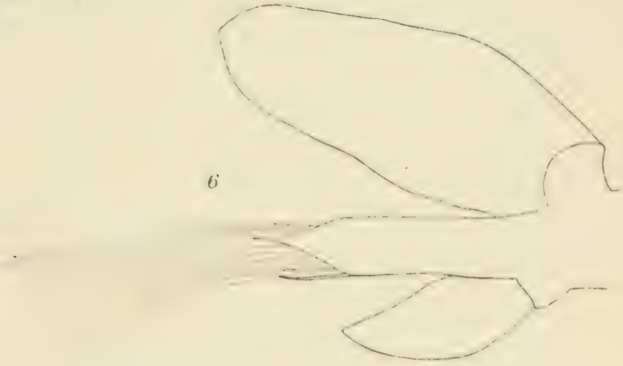

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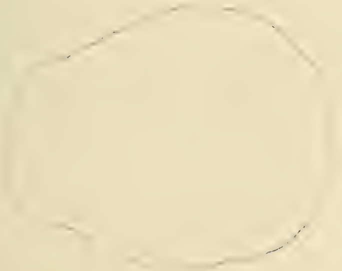

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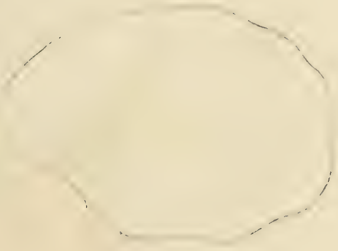

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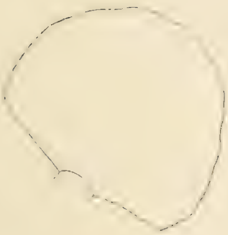

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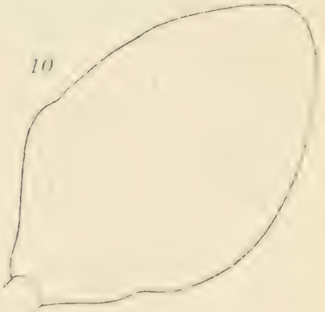

PLATE 24.

PLATE 24.

Plotohelmis alata Chamberlin.

Figures 1-3.

1.— Notocirrus of eighteenth parapodium. × 63.
2.— Notocirrus from near thirtieth somite. × 63.
3.— Notocirrus of twenty fifth parapodium. × 63.

Torea pelagica Chamberlin.

Figures 4-9.

4.— Anterior end, ventral view (parapodia not shown). × 27.
5.— Prostomium, dorsal view. × 63.
6.— Distal end of seta of fifteenth parapodium. × 1075.
7.— Notocirrus of fifteenth parapodium. × 63.
8.— Neurocirrus of fifteenth parapodium. × 63.
9.— Neurocirrus of fifth parapodium. × 63.

Mauita nans Chamberlin.

Figures 10, 11.

10.— Distal portion of aciculum. × cir. 307.
11.— Parapodium of fourth somite (first complete one). × 27.

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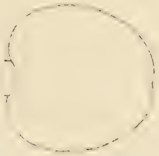
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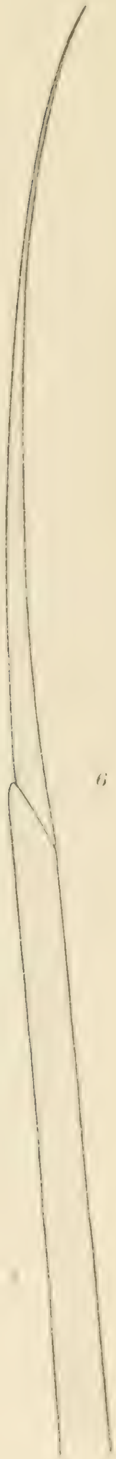
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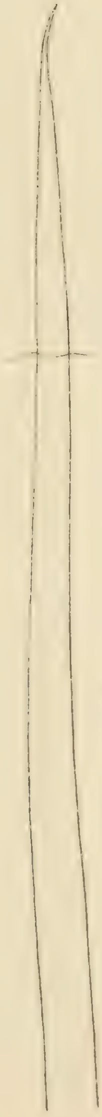
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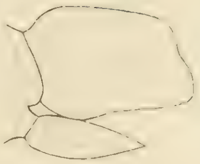
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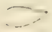
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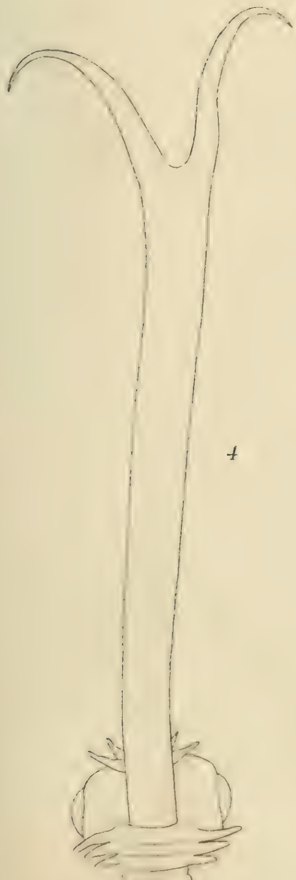
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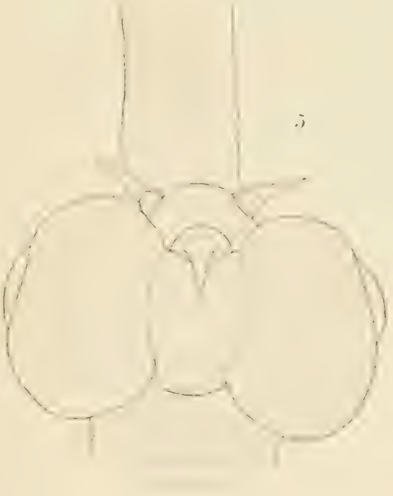
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PLATE 25.

PLATE 25.

Mauita nans CHAMBERLIN.

Figures 1–6.

1.— Distal end of seta. × 1036.
2.— Anterior end, ventral view (left proboscidial process broken off). × 16.
3.— Prostomium, dorsal view. × 16.
4.— Parapodium of eighth somite, anterior view. × 27.
5.— Fiftieth parapodium, anterior view. × 27.
6.— Eighteenth parapodium, anterior view. × 27.

Rhynchonerella pycnocera CHAMBERLIN.

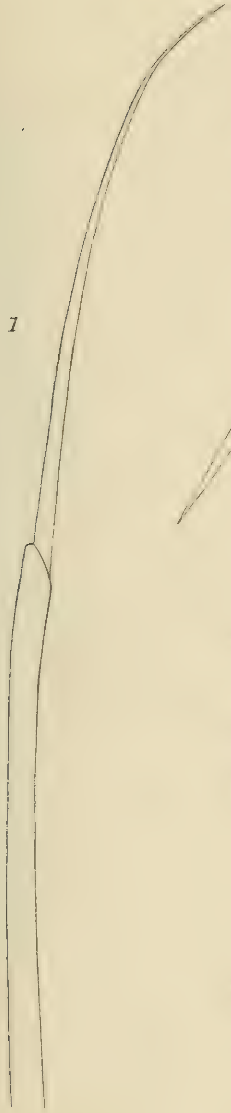
Figures 7, 8.

7.— Style of second neurocirrus. × 48.
8.— Notocirrus from anterior part of caudal region. × 48.

Rhynchonerella parva CHAMBERLIN.

Figures 9, 10.

9.— Notocirrus of twenty second parapodium. × 96.
10.— Neurocirrus of twenty second parapodium. × 96.



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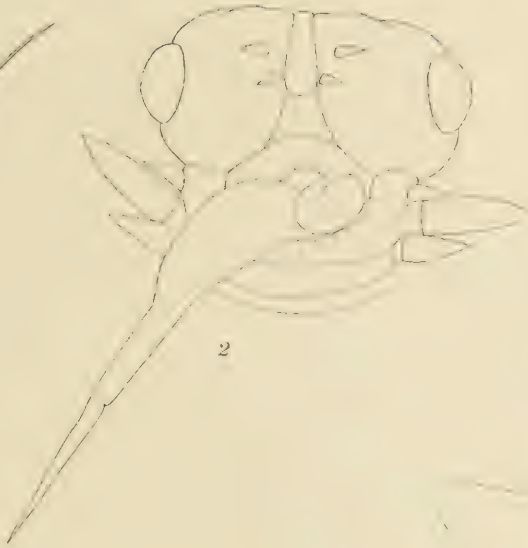

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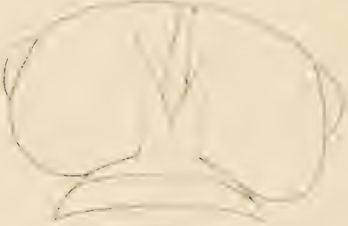

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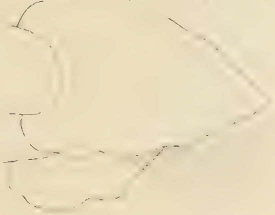

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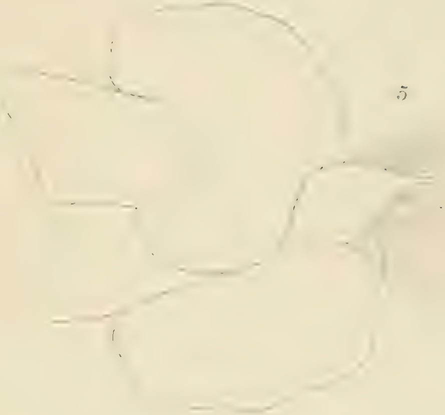

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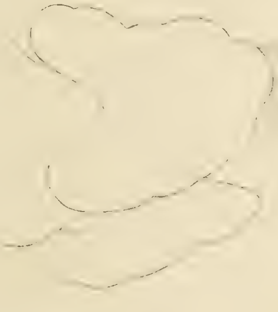

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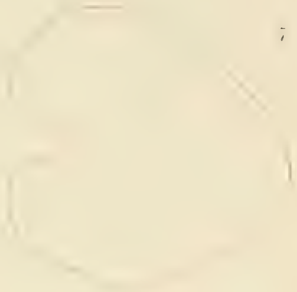

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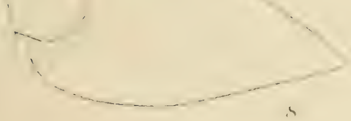

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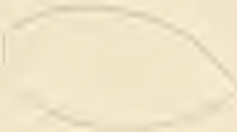

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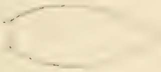

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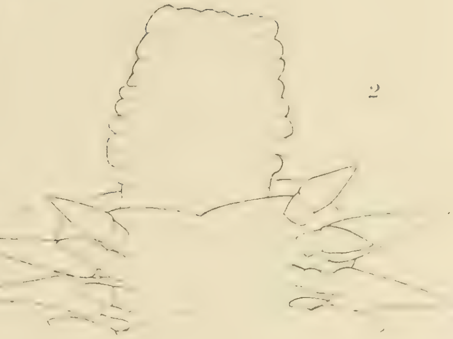
PLATE 26.

PLATE 26.

Rhynchonerella pycnocera CHAMBERLIN.

Figures 1–6.

1.— Anterior end, dorsal view. × 20.
2.— Anterior end, ventral view. × 20.
3.— Parapodium, middle region of body. × 48.
4.— Parapodium, caudal region of body. × 48.
5.— Tip of finer seta of first parapodium. × 1075.
6.— Distal end of coarser seta of first parapodium. × 1075.



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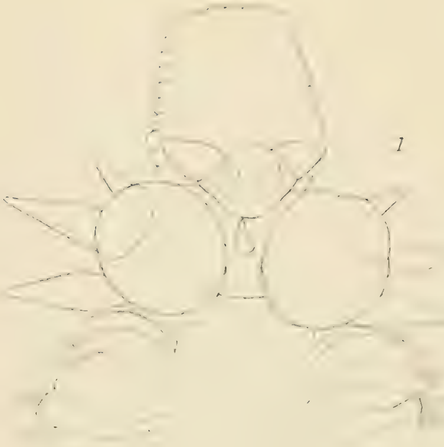

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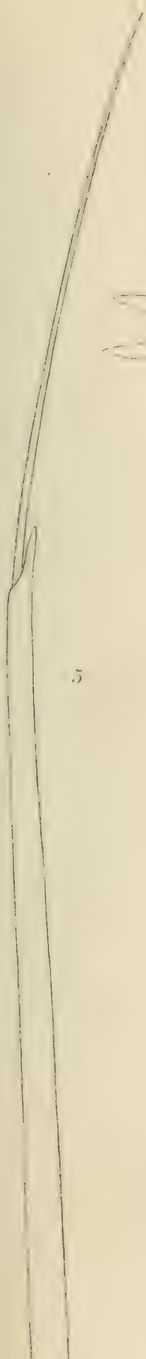

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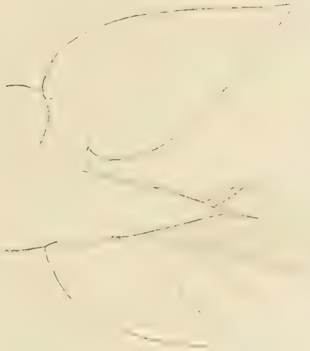

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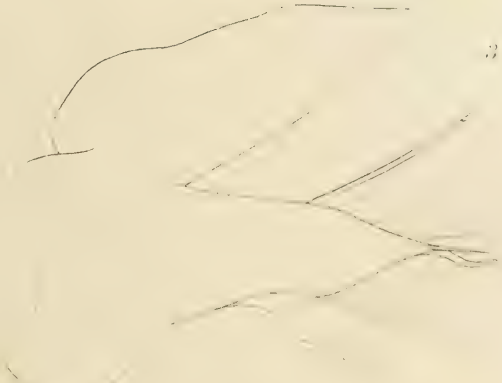

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PLATE 27.

PLATE 27.

Tompoteris eura Chamberlin.

Figures 1, 2.

1.— Caudal end, dorsal view. × cir. 20.
2.— First left parapodium, ventral view. × 63.

Tomopteris innatans Chamberlin.

Figure 3.

3.— Brain and eyes in outline.

Tomopteris idiura Chamberlin.

Figures 4–6.

4.— Anterior end, ventral view. × 27.
5.— Tenth parapodium, caudal view. × 63.
6.— Seventeenth parapodium (first caudal), ectocephalic view. × 63.

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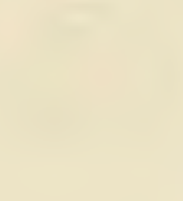
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PLATE 28.

PLATE 28.

Synelmis simplex Chamberlin.

Figures 1–5.

1.— Anterior end, view from side. × 45.
2.— Anal cirri. × 63.
3.— Parapodium from middle region of body. × 96.
4.— Tips of notopodial seta (at the right) and aciculum. × 407.
5.— Distal portion of neuropodial seta. × 1075.

Kainonereis alata Chamberlin.

Figures 6–9.

6.— Anterior end, lateral view. × cir. 52.
7.— Pygidium and anal cirri, ventral view. × 96.
8.— Falcate neuropodial seta of seventh left parapodium, dorsal view. × 1075.
9.— Elytron and cirrus of seventh left parapodium, dorsal view. × 96.

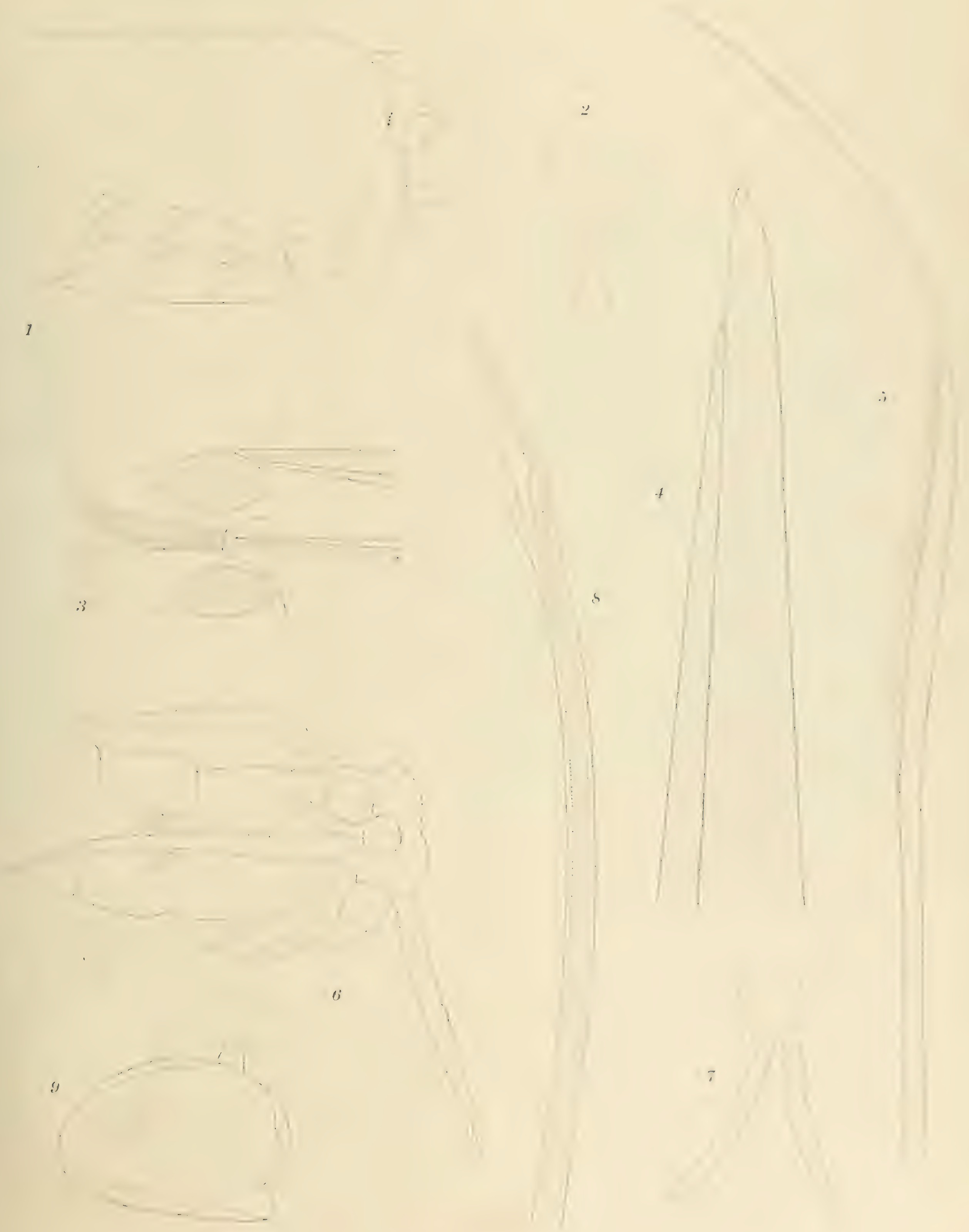

PLATE 29.

PLATE 29.

Kainonereis alata Chamberlin.

Figures 1–8.

1.— Fourth left parapodium, anterior view. × 96.
2.— Sixth right parapodium, anterior view. × 96.
3.— Eleventh right parapodium, caudal view. × 96.
4.— Twelfth right parapodium, anterior view. × 96.
5.— Left parapodium from middle region, anterior view. × 96.
6.— Distal portion of notopodial seta from middle region of body. × 1075.
7.— Notopodial seta, sixth parapodium. × 1075.
8.— Anterior end of alimentary canal, in outline, showing caeca. × 96.

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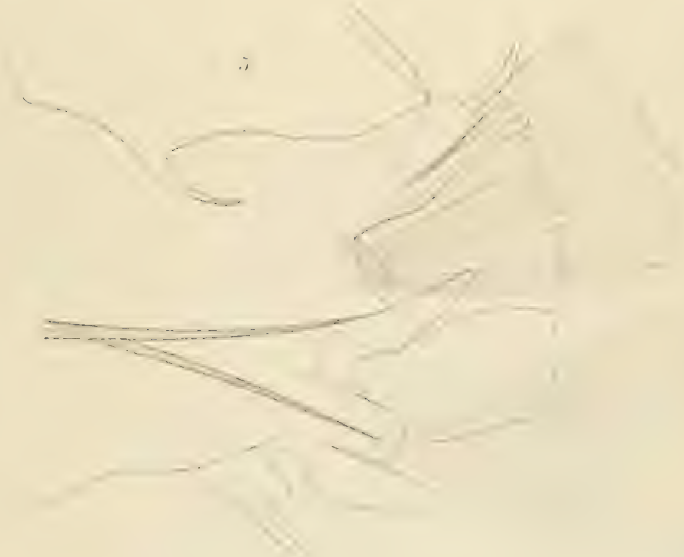

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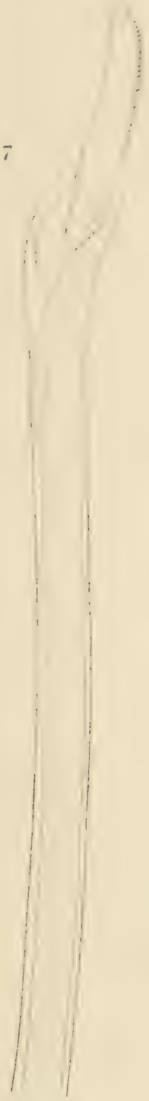

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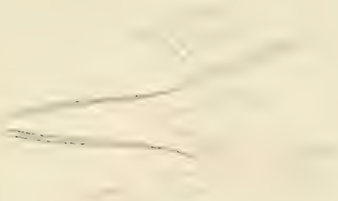

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PLATE 30.

PLATE 30.

Uncinereis subita Chamberlin.

Figures 1–4.

1.— Parapodium from middle region of body. × 63.
2.— Distal end of neuropodial seta, ordinary long-bladed form. × 1075.
3.— Neuropodial seta, short-bladed form, from middle region of body. × 1075.
4.— Stout notopodial seta, or crochet, from middle region of body. × 1075.

Platynereis polyscalma Chamberlin.

Figures 5–8.

5.— Neuropodial seta (heterogomph of first type) from third parapodium of epitokous female. × 1075.
6.— Neuropodial seta (heterogomph of second type) from eighth parapodium of epitokous female, × 1075.
7.— Distal portion of natatory seta from middle region of body. × 278.
8.— Tip of blade of same. × 1075.

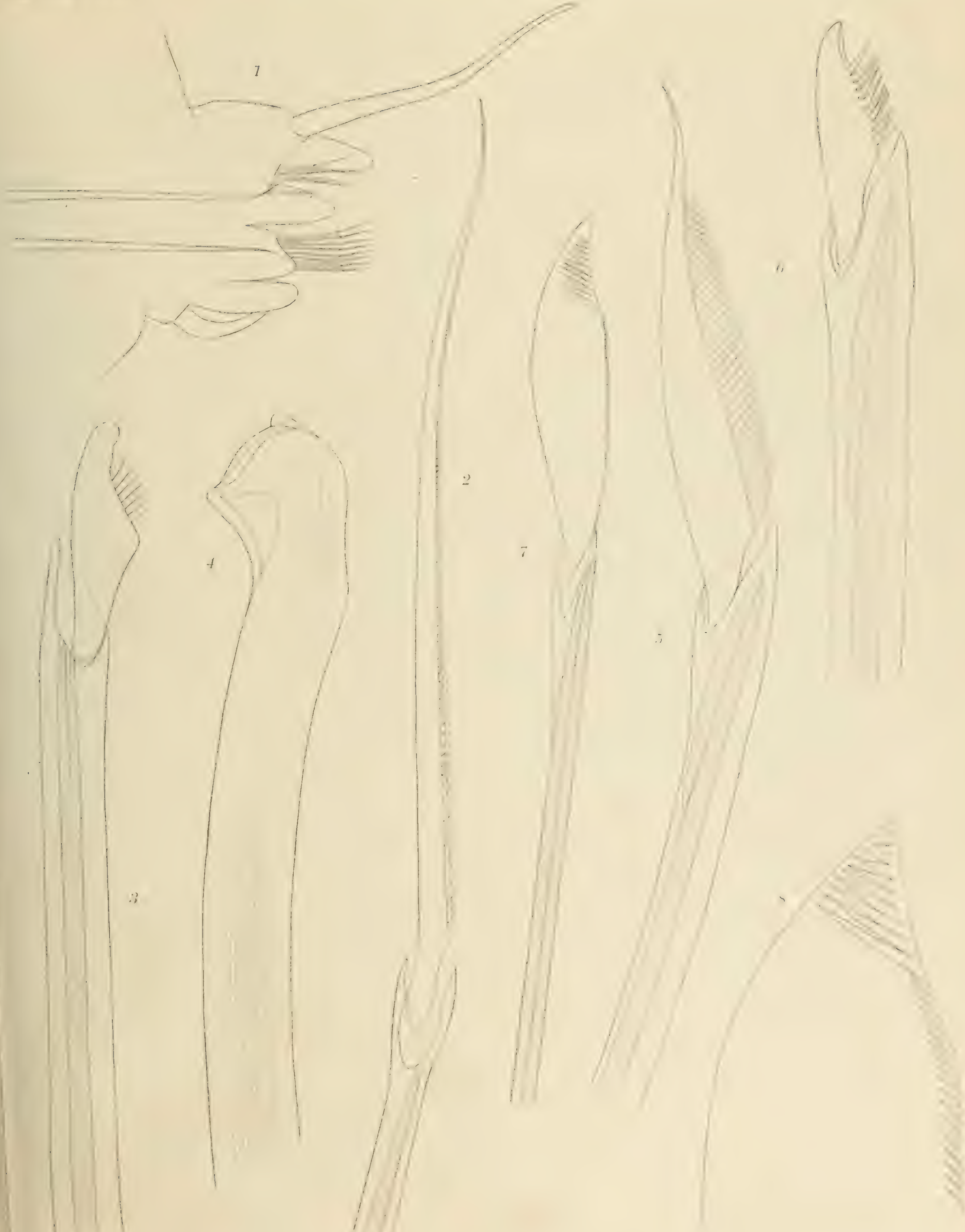


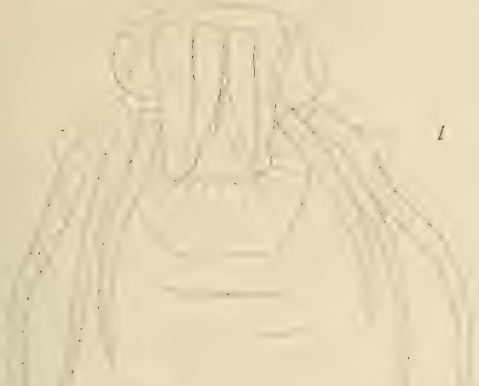
PLATE 31.

PLATE 31.

Platynereis polyscalma Chamberlin.

Figures 1–10.

1.— Anterior region of epitokous female, ventral view. × 45.
2.— Anterior region of epitokous male, ventral view. × 45.
3.— Left maxilla of epitokous female, ventral view. × 45.
4.— Left maxilla of epitokous male, ventral view. × 45.
5.— Seventh parapodium of epitokous male. × 63.
6.— Eighth parapodium of epitokous male. × 63.
7.— Penult parapodium of epitokous male. × 96.
8.— Ultimate parapodium of epitokous male. × 96.
9.— Distal portion or ridged seta from ultimate parapodium (viewed a little obliquely to broad surface). × 1075.
10.— Distal end of shaft of homogomph notopodial seta of epitokous female. × 1075.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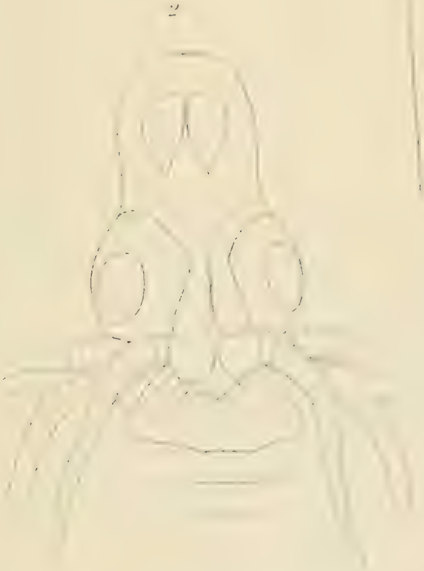
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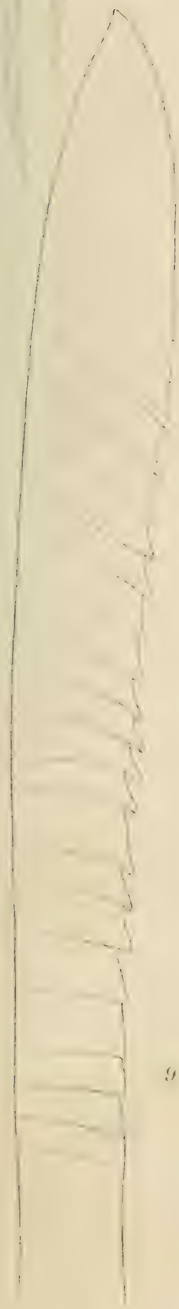
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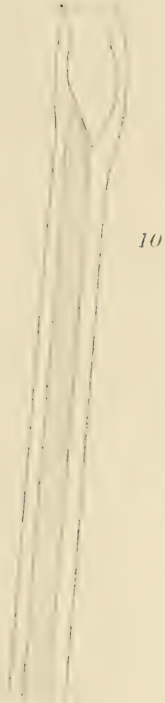
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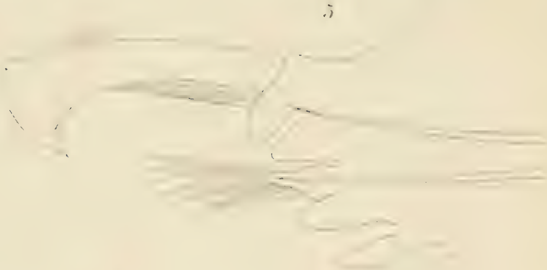
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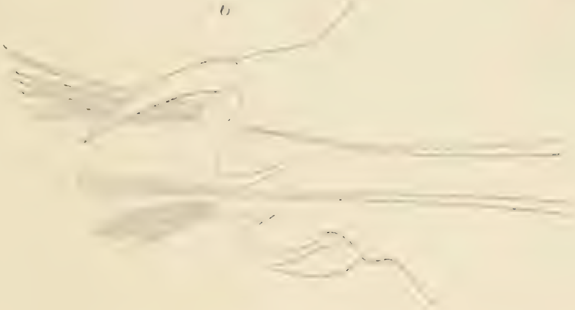
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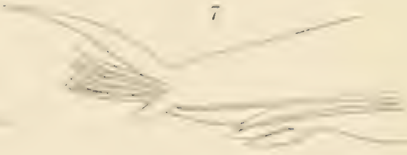
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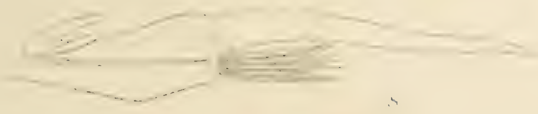
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PLATE **32.**

PLATE 32.

Platynereis polyscalma Chamberlin.

Figures 1, 2.

1.— Parapodium from middle region of epitokous female. × 63.
2.— Parapodium from caudal region of epitokous female. × 96.

Nereis segrex Chamberlin.

Figures 3–5.

3.— Parapodium. × 27.
4.— Socket and adjoining parts of homogomph seta. × 1075.
5.— Distal end of neuropodial heterogomph. × 1075.

Nereis leuca Chamberlin.

Figures 6–8.

6.— Distal end of falcate neuropodial seta. × 1075.
7.— Falcate heterogomph of second type from same preparation as the preceding. × 1075.
8.— Natatory notopodial seta from parapodium of middle region. × 278.

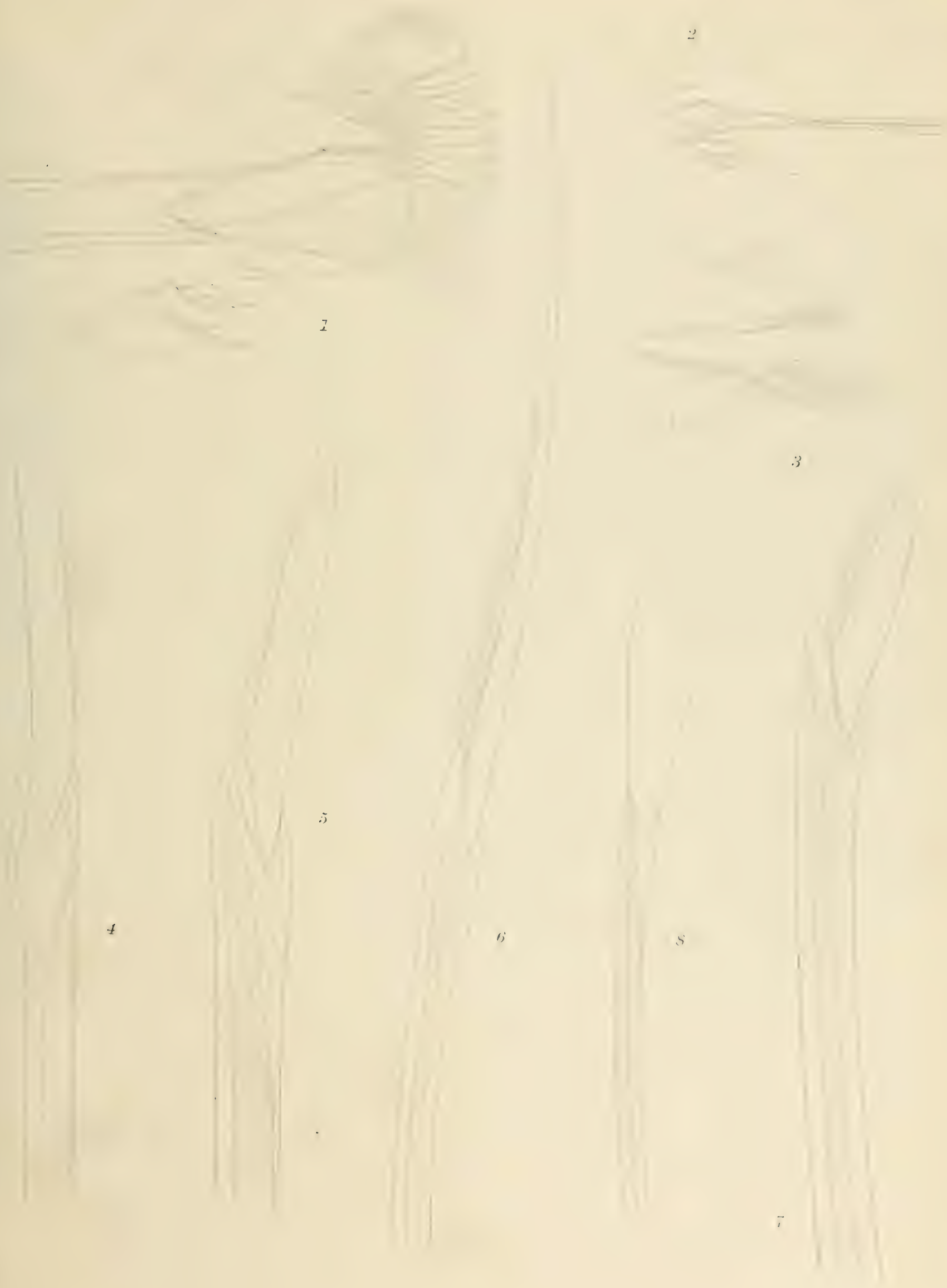

PLATE 33.

PLATE 33.

Nereis leuca Chamberlin.

Figures 1–6.

1.— Anterior end, dorsal view. × 45.
2.— Fourth parapodium, epitokous male. × 63.
3.— Sixth parapodium, epitokous male. × 63.
4.— Parapodium from middle region of posterior division of epitokous male. × 63.
5.— Notopodial seta, distal end, from sixth parapodium. × 1075.
6.— Neuropodial homogomph with tip of the shorter type from fourth parapodium. × 1075.

Nereis caenocirrus Chamberlin.

Figures 7, 8.

7.— Falcate seta from fourth parapodium. × 1075.
8.— Cirrus of thirtieth parapodium, dorsal view (the papillae are on the anterior side). × 63.

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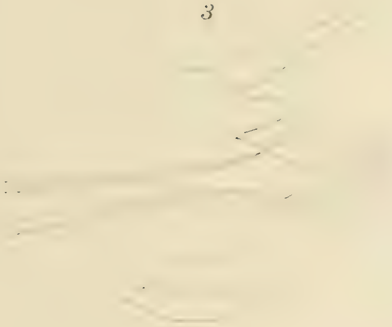
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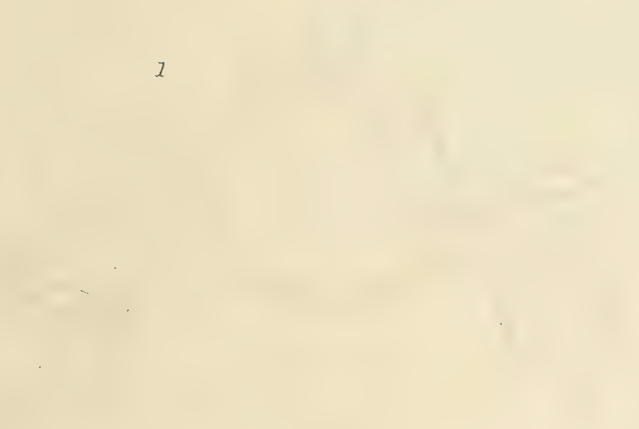
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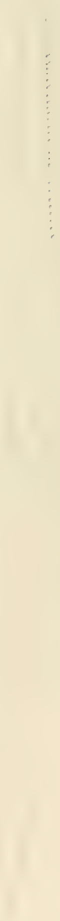
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PLATE 34.

PLATE 34.

Nereis caenocirrus CHAMBERLIN.

Figures 1–6.

1.— Anterior end, dorsal view, epitokous male. × 45.
2.— Thirtieth parapodium of heteronereid division of same, caudal view. × 63.
3.— Eleventh parapodium of heteronereid division of same, caudal view. × 63.
4.— Notopodial seta. × 1075.
5.— Notopodial natatory seta from middle region. × 278.
6.— Falcate seta of second type from fourth parapodium. × 1075.

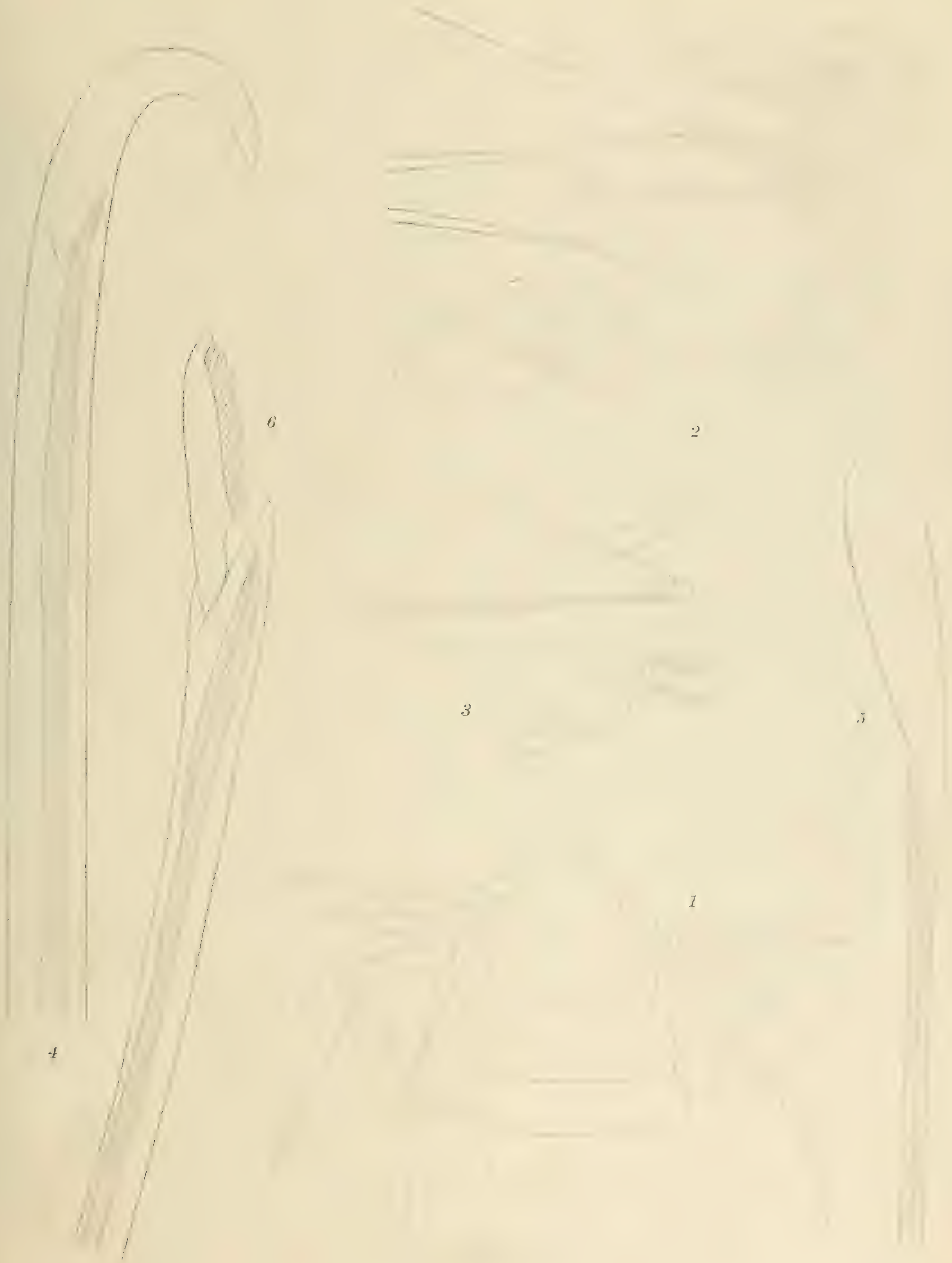

PLATE 35.

PLATE 35.

Nereis caenocirrus CHAMBERLIN.

Figures 1, 2.

1.— Fourth right parapodium, anterior view. × 73.
2.— Seventh right parapodium, anterior view. × 73.

Pseudonereis atopodon CHAMBERLIN.

Figures 3-5.

3.— Parapodium from caudal region. × cir. 26.
4.— Homogomph seta from caudal region. × cir. 600.
5.— Neuropodial heterogomph seta from caudal region. × cir. 600.

Ceratonereis fakaravae CHAMBERLIN.

Figures 6, 7.

6.— Notopodial seta from middle region of body. × cir. 600.
7.— Stouter neuropodial seta (less highly magnified).

Perinereis helleri GRUBE.

Figure 8.

8.— Heterogomph seta from anterior region. × cir. 600.

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PLATE 36.

PLATE 36.

Leptoecia abyssorum CHAMBERLIN.

Figures 1–6.

1.— Anterior end, dorsal view. × 27.
2.— Anterior end, ventral view. × 27.
3.— Maxillae, dorsal view. × 45.
4.— Mandibles, ventral view. × 45.
5.— Seta from posterior region of body, frontal view. × 429.
6.— The same, side view. × 429.

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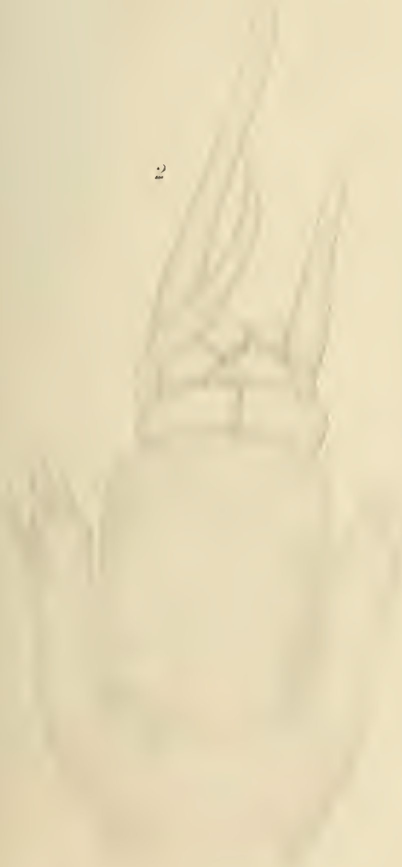

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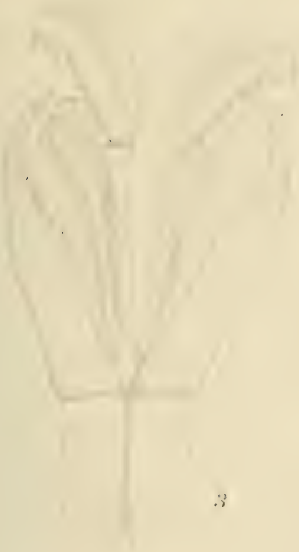

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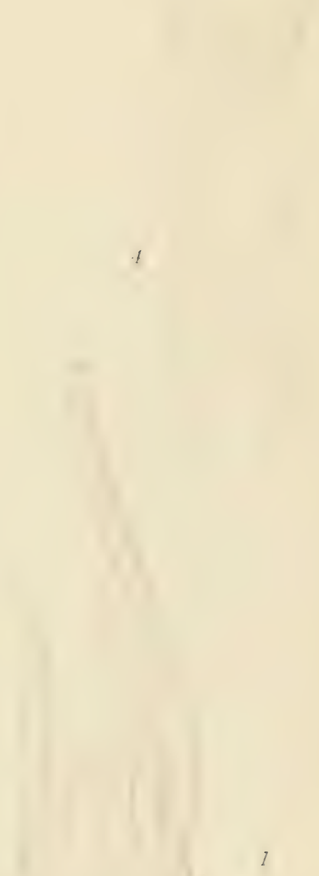

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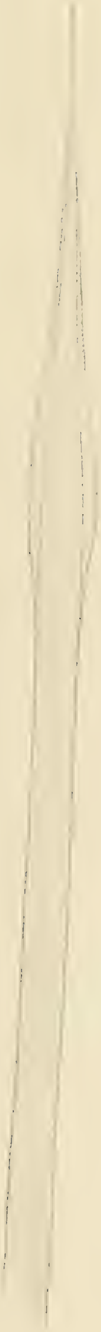

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PLATE **37.**

PLATE 37.

Leptoecia abyssorum Chamberlin.

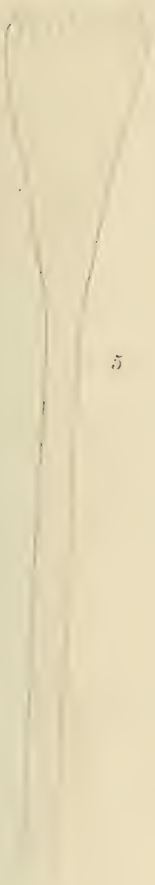
Figures 1–8.

1.— First parapodium, ectal view. × 45.
2.— Second parapodium, ectal view. × 45.
3.— Third parapodium, ectal view. × 45.
4.— Ninth parapodium. × 45.
5.— Pectinate seta from posterior region. × 1075.
6.— Distal portion of aciculum from middle region. × 429.
7.— Crochet from posterior region of body. × 429.
8.— Hooded crochet of parapodium I. × 429.

Hyalinoecia leucacra Chamberlin.

Figures 9, 10.

9.— Pectinate seta of sixtieth somite. × 1075.
10.— Tip of limbate seta of sixty sixth somite. × 278.



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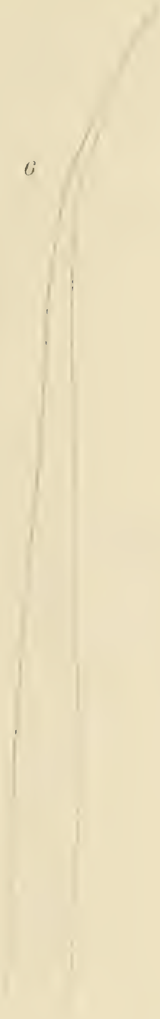

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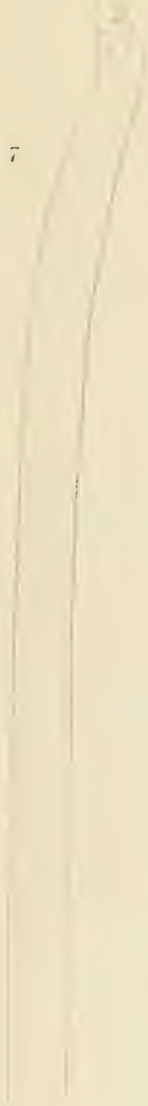

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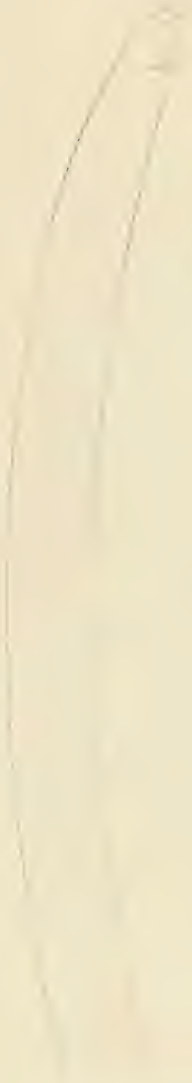

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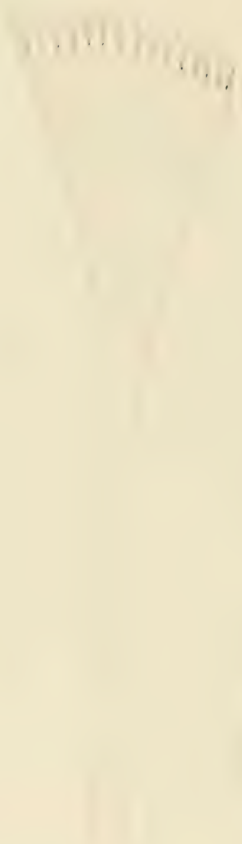

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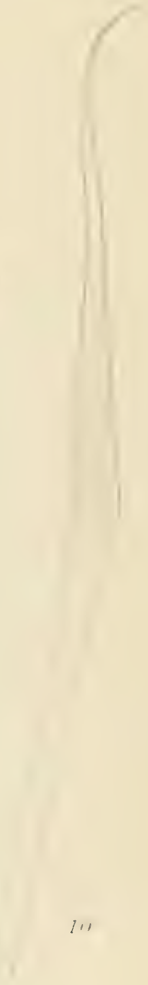

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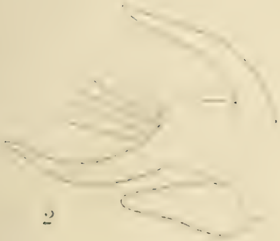

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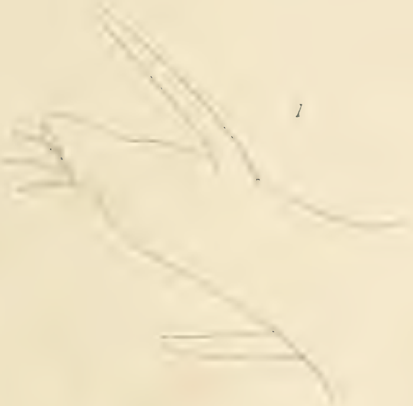

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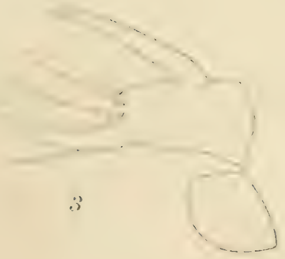

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PLATE 38.

PLATE 38.

Hyalinoecia leucacra Chamberlin.

Figures 1–3.

1.— End of crochet from sixty sixth somite of paratype. × 278.
2.— Hooded crochet of first parapodium. × 278.
3.— Mandible of paratype. × 45.

Hyalinoecia tecton Chamberlin.

Figures 4–9.

4.— Mandibles, dorsal view. × 27.
5.— Maxillae of left side. × 27.
6.— Crochet from posterior region, distal portion. × 278.
7.— Pectinate seta from anterior parapodium. × 1075.
8.— Blade of limbate seta from ventral fascicle of a posterior parapodium. × 278.
9.— Blade of limbate seta from dorsal group of same parapodium. × 278.

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PLATE 39.

PLATE 39.

Hyalinoecia tecton Chamberlin.

Figures 1, 2.

1.— Tips of setae from first parapodium. × 63.
2.— Tip of seta from same, more slender form. × 63.

Paronuphis solenotecton Chamberlin.

Figures 3–8.

3.— Second left parapodium, caudal view. × 63.
4.— First right parapodium, caudal view. × 63.
5.— Left mandible, ventral view. × 63.
6.— Maxillae I, right blade omitted. × 278.
7.— Limbate seta from posterior region of body. × 429.
8.— Compound seta of first parapodium. × 429.

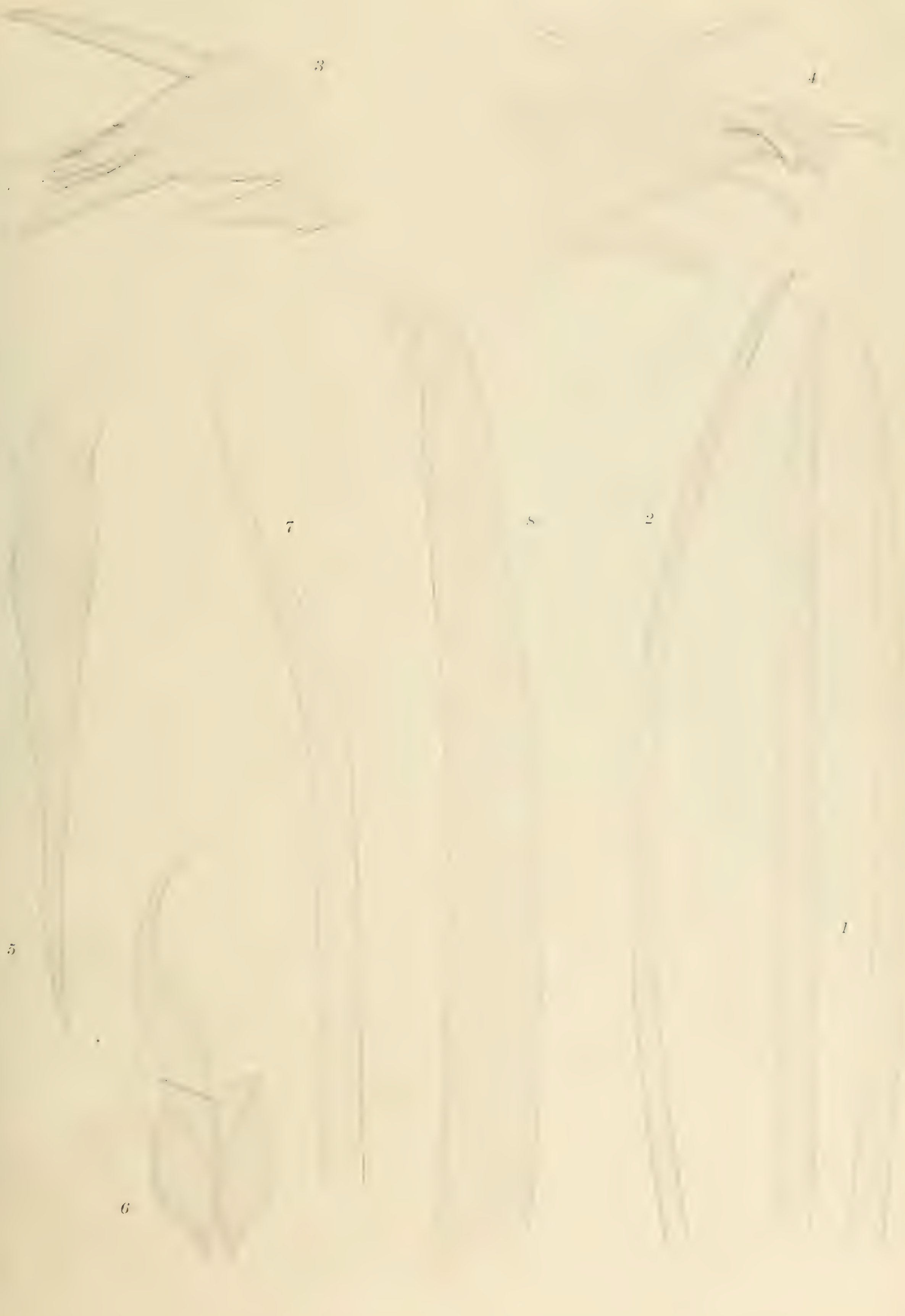

PLATE 40.

PLATE 40.

Paronuphis solenotecton Chamberlin.

Figures 1, 2.

1.— Pectinate seta from second parapodium. × 1075.
2.— Crochet from posterior region. × 429.

Onuphis proalopus Chamberlin.

Figures 3-8.

3.— Prostomium and peristomium and appendages, dorsal view. × 27.
4.— Maxillae (left blade of I omitted). × 45.
5.— Labium. × 27.
6.— Tip of aciculum. × 429.
7.— Coarse ventral seta of sixth parapodium. × 429.
8.— Crochet, middle region of body. × 429.

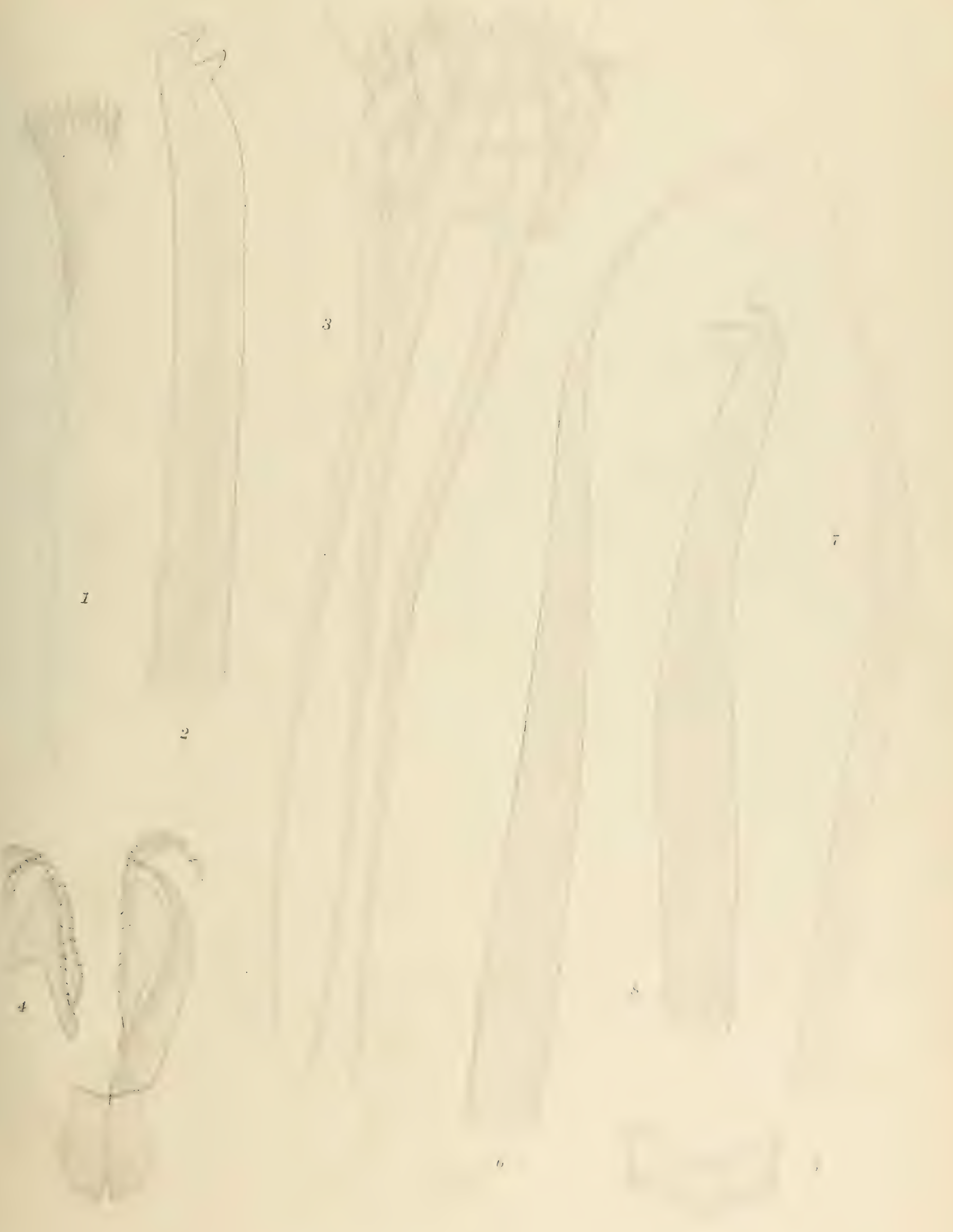

PLATE **41**.

PLATE 41.

Onuphis proalopus CHAMBERLIN.

Figures 1-10.

1.— Compound crochet, fourth parapodium. × 429.
2.— Pectinate seta. × 1075.
3.— First parapodium, ectal view. × 27.
4.— Fourth parapodium, ectoventral view. × 27.
5.— Seventh right parapodium, subectal view. × 27.
6.— Sixth parapodium, ectoventral view. × 27.
7.— First right branchia, with cirrus. × 45.
8.— Sixth left branchia, with cirrus. × 45.
9.— Ninth right branchia with cirrus. × 45.
10.— Twentieth left branchia, with cirrus. × 45.

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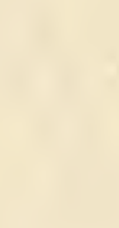

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PLATE **42.**

PLATE 42.

Onuphis crassisetosa CHAMBERLIN.

Figures 1–6.

1.— Anterior end, dorsal view. × 27.
2.— Mandibles. × 45.
3.— Maxillae. × 45.
4.— Composite crochet of second parapodium. × 429.
5.— Limbate seta from middle region of body. × 429.
6.— Distal end of aciculum from middle region of body. × 429.

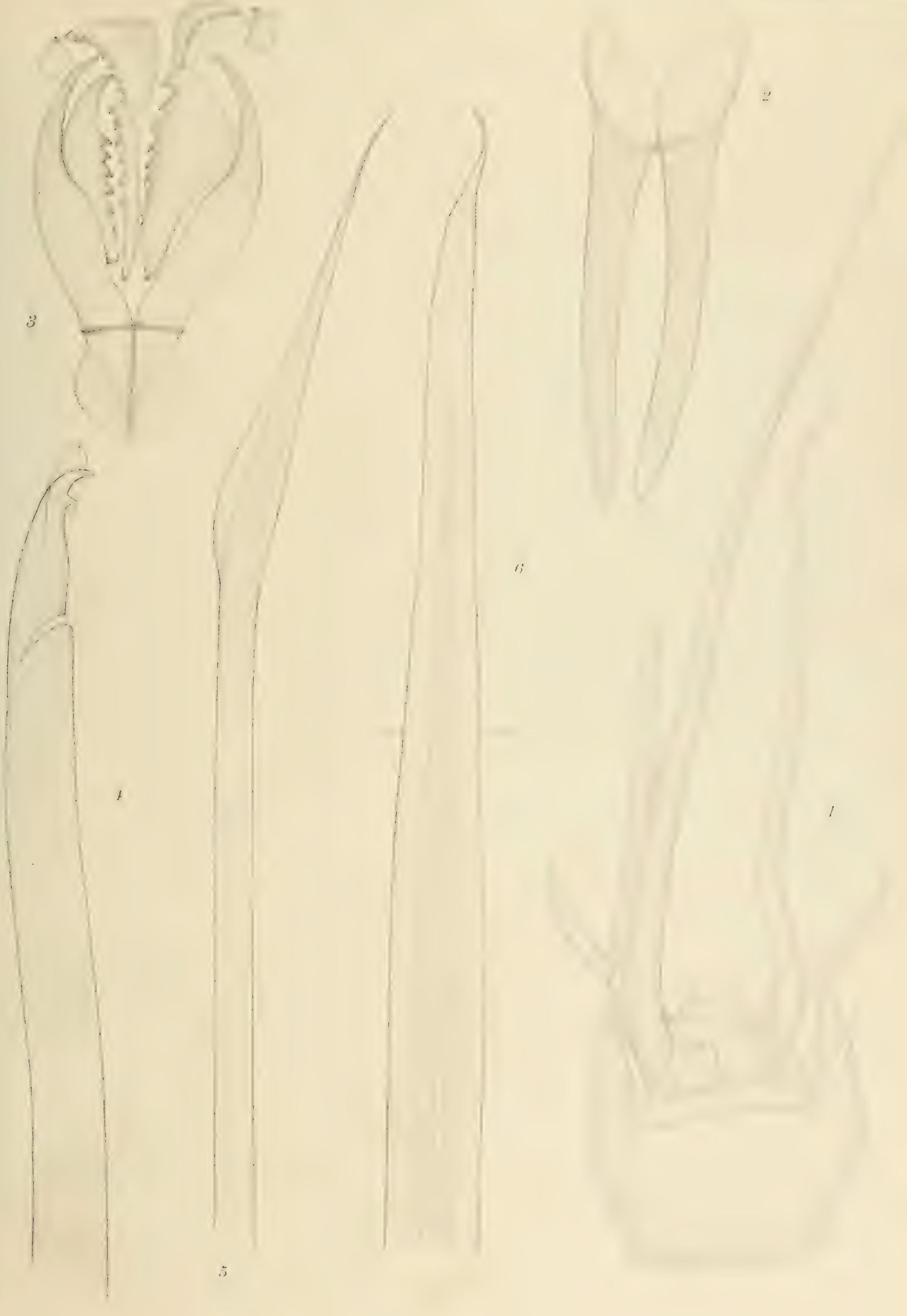


PLATE 43.

PLATE 43.

Onuphis crassisetosa Chamberlin.

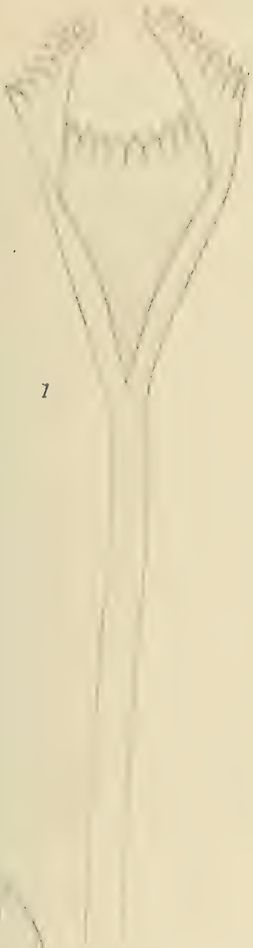
Figures 1–7.

1.— Pectinate seta from middle region of body. × 1075.
2.— Crochet from middle region of body. × 429.
3.— First parapodium of type. × 45.
4.— Second parapodium, ectal view (paratype). × 45.
5.— Third parapodium of type. × 45.
6.— Fourth parapodium of type. × 45.
7.— Fourth branchia, subectal view. × 63.

Onuphis nannognathus Chamberlin.

Figures 8–11.

8.— Maxillae of right side. × 27.
9.— Crochet from middle region of body. × 429.
10.— Tip of aciculum, middle region of body. × cir. 175.
11.— Pectinate seta, middle region of body. × 1075.



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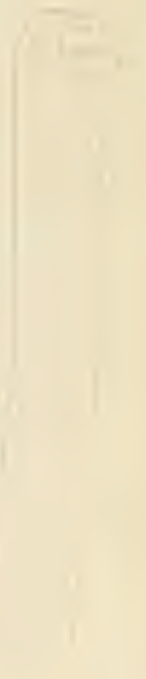

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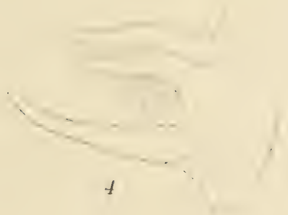

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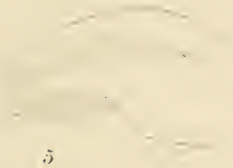

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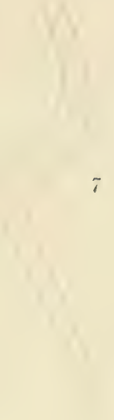

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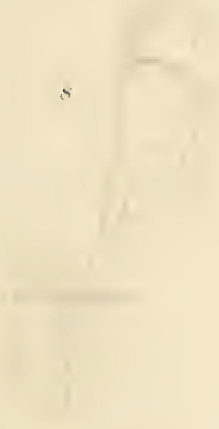

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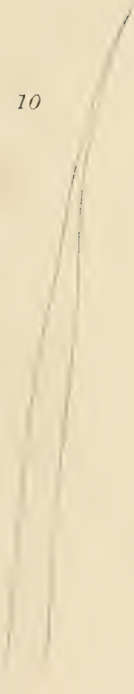

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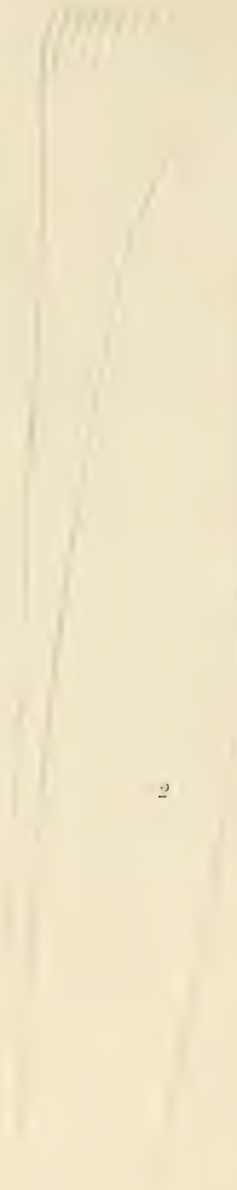

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PLATE 44.

PLATE 44.

Onuphis nannognathus CHAMBERLIN.

Figures 1–8.

1.— Composite crochet of sixth parapodium. × 429.
2.— Distal end of simple, coarser ventral seta from seventh parapodium. × 429.
3.— Distal portion of simple dorsal seta of seventh parapodium. × 429.
4.— Twentieth branchia, with notocirrus. × 27.
5.— Branchia, with cirrus, from near the seventieth somite. × 27.
6.— Anterior end, ventral view. × 27.
7.— First right parapodium, ectal view. × 27.
8.— Fifth right parapodium, ectal view. × 27.

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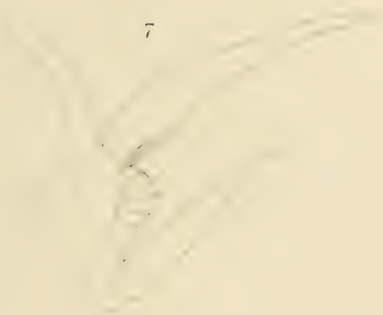

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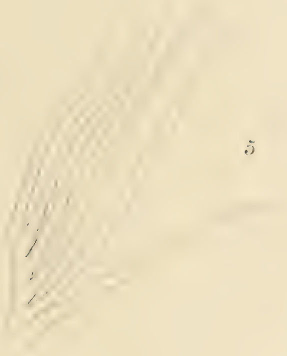

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PLATE 45.

PLATE 45.

Onuphis lepta CHAMBERLIN.

Figures 1–7.

1.— Anterior end, ventral view (paratype). × 27.
2.— Maxillae. × 45.
3.— Tip of crochet from middle region of body. × 429.
4.— Crochet from second parapodium. × 1075.
5.— Pectinate seta from middle region of body. × 1075.
6.— Distal end of seta from seventh parapodium. × 429.
7.— Distal end of aciculum from middle region of body. × 1075.

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PLATE 46.

PLATE 46.

Onuphis nannognathus CHAMBERLIN.

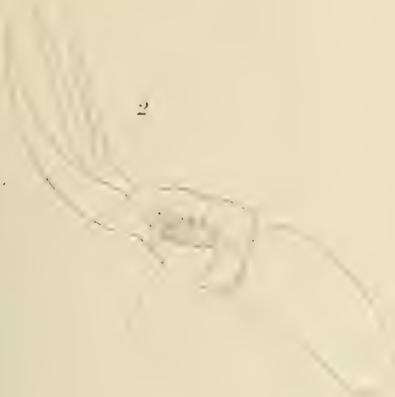
Figures 1, 2.

1.— Seventh parapodium, ectal view. × 27.
2.— Ninth parapodium, ectal view. × 27.

Onuphis lepta CHAMBERLIN.

Figures 3-12.

3.— First left parapodium, ectal view. × 45.
4.— Third right parapodium, ectal view. × 45.
5.— Fourth right parapodium, ectal view. × 45.
6.— Fifth right parapodium, ectal view. × 45.
7.— Sixth right parapodium, ectal view. × 45.
8.— Seventh right parapodium, ectal view. × 45.
9.— First left branchia, ectodorsal view. × 63.
10.— Third left branchia, ectodorsal view. × 63.
11.— Seventh right branchia, subdorsal view. × 63.
12.— Twenty third right branchia, dorsal view. × 63.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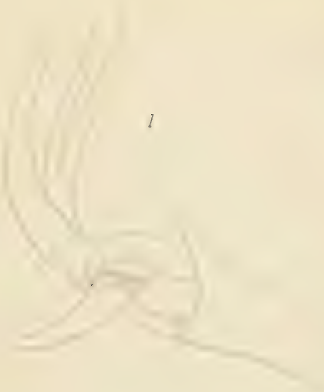
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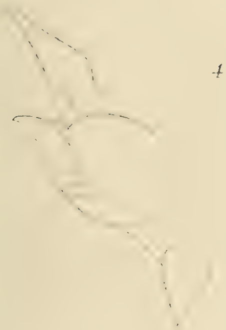
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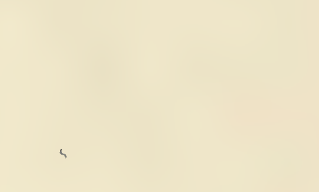
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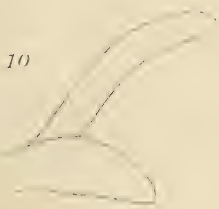
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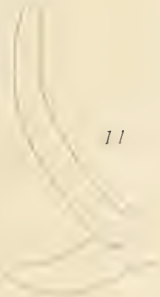
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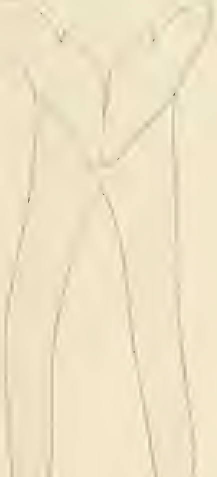
PLATE 47.

PLATE 47.

Onuphis socia CHAMBERLIN.

Figures 1–11.

1.— Mandibles. × 27.
2.— Right maxillae (carrier-plate of I complete). × 27.
3.— Tip of compound crochet of first parapodium. × 1075.
4.— Dorsal seta. × 429.
5.— Ordinary crochet, distal end. × 429.
6.— Distal portion of aciculum. × 429.
7.— Second left parapodium, ectal view. × 27.
8.— Fourth parapodium, ectal view. × 27.
9.— First branchia with cirrus. × 45.
10.— Second right branchia with cirrus. × 45.
11.— Third branchia with cirrus, dorsal view. × 45.



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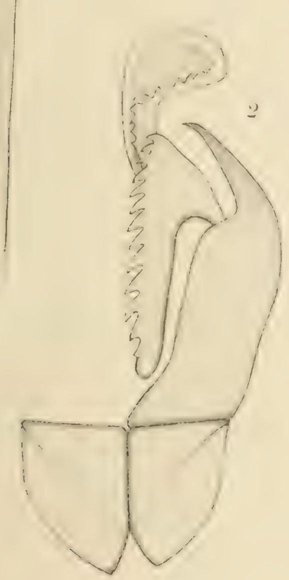

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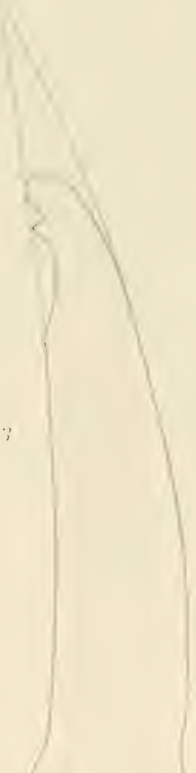

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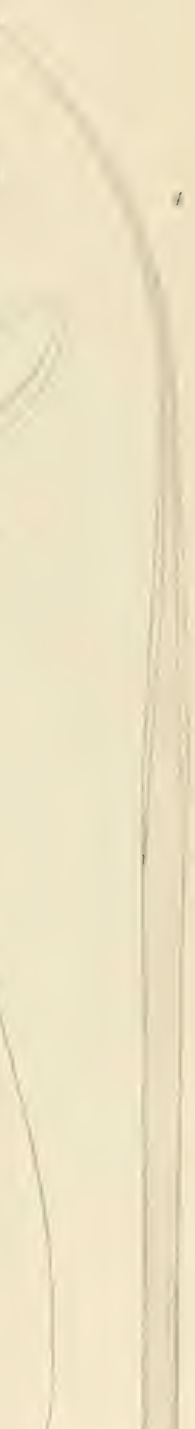

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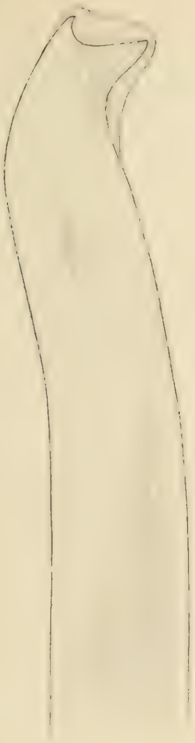

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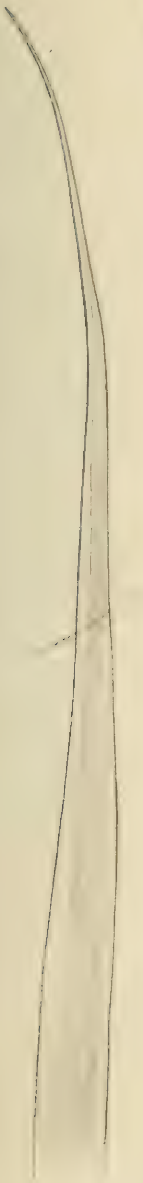

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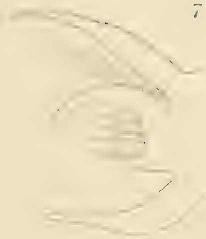

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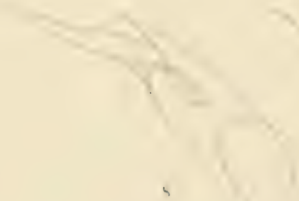

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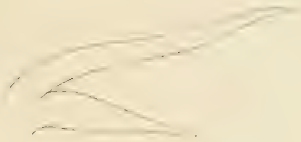

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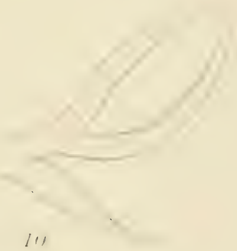

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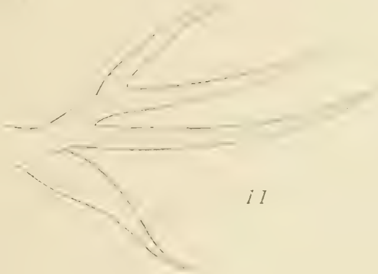

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PLATE 48.

PLATE 48.

Onuphis socia CHAMBERLIN.

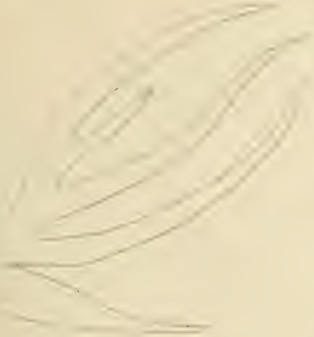
Figures 1-4.

1.— Fifth branchia, dorsal view. × 45.
2.— Eleventh right branchia. × 45.
3.— Thirteenth left branchia, dorsal view. × 45.
4.— Thirty fourth right branchia, sublateral view. × 45.

Onuphis pachytmema CHAMBERLIN.

Figures 5-11.

5.— First left parapodium, ectal view. × 27.
6.— Second left parapodium, ectal view. × 27.
7.— Fourth parapodium, ectal view. × 27.
8.— First right branchia, with notocirrus. × 45.
9.— Third left branchia, with notocirrus. × 45.
10.— Fifth left branchia, with notocirrus. × 45.
11.— Last distinct left branchia of type. × 45.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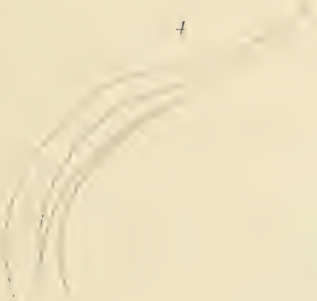
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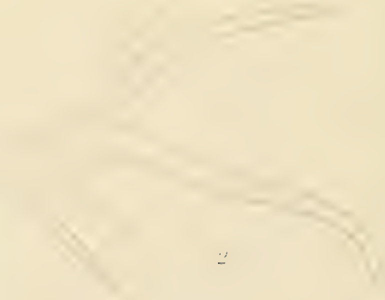
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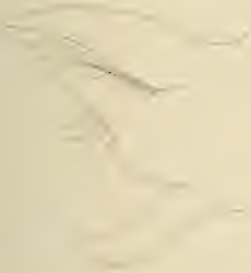
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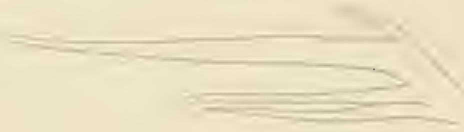
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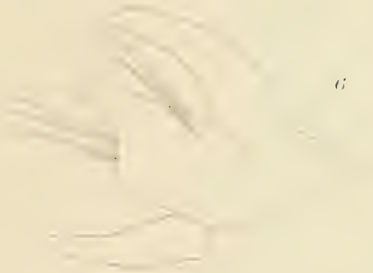
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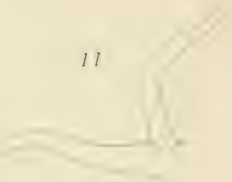
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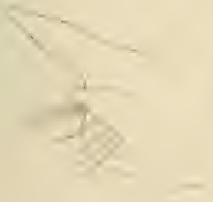
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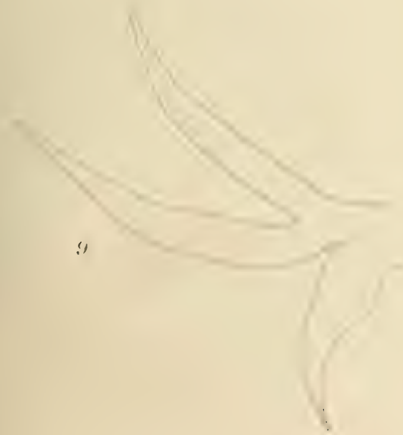
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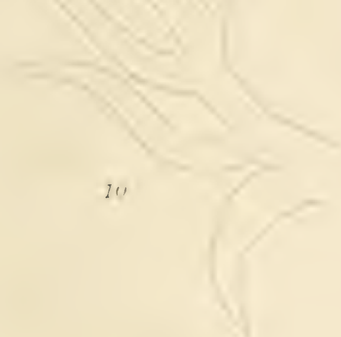
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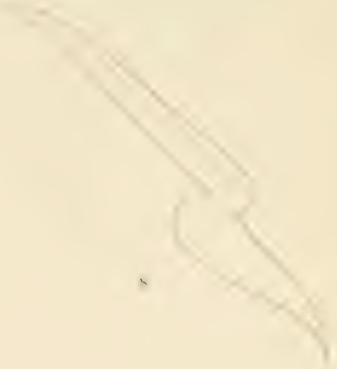
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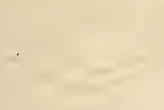
PLATE 49.

PLATE 49.

Onuphis pachytmema CHAMBERLIN.

Figures 1–8.

1.— Seventh left branchia with cirrus, subdorsal view. × 45.
2.— Eighth left branchia with cirrus, subdorsal view. × 45.
3.— Twenty second right branchia with cirrus, ectodorsal view. × 45.
4.— Twenty fifth right branchia, subdorsal view. × 45.
5.— Anterior end, ventral view. × 19.
6.— First and second maxillae. × 27.
7.— Mandibles. × 27.
8.— Distal portion of crochet from middle region of body. × 429.



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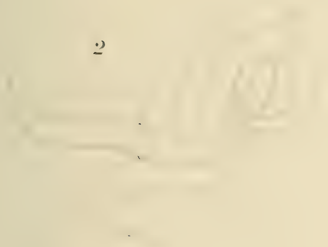

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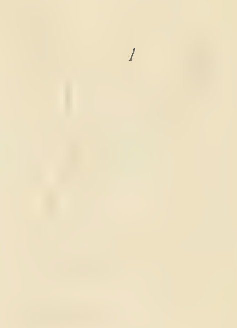

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PLATE 50.

PLATE 50.

Onuphis pachytmema CHAMBERLIN.

Figures 1–6.

1.— Distal end of composite crochet from the second parapodium. × 1075.
2.— Tip of coarse ventral seta corresponding to composite crochets of first three parapodia, from fourth parapodium. × 1075.
3.— Distal portion of ventral seta from middle region of body. × 429.
4.— Dorsal capillary seta from second parapodium. × 429.
5.— Pectinate seta from middle region of body. × 1075.
6.— Distal portion of aciculum of sixty sixth somite of paratype. × 278.

Onuphis litabranchia CHAMBERLIN.

Figure 7.

7.— Maxillae of left side, dorsal view. × 45.

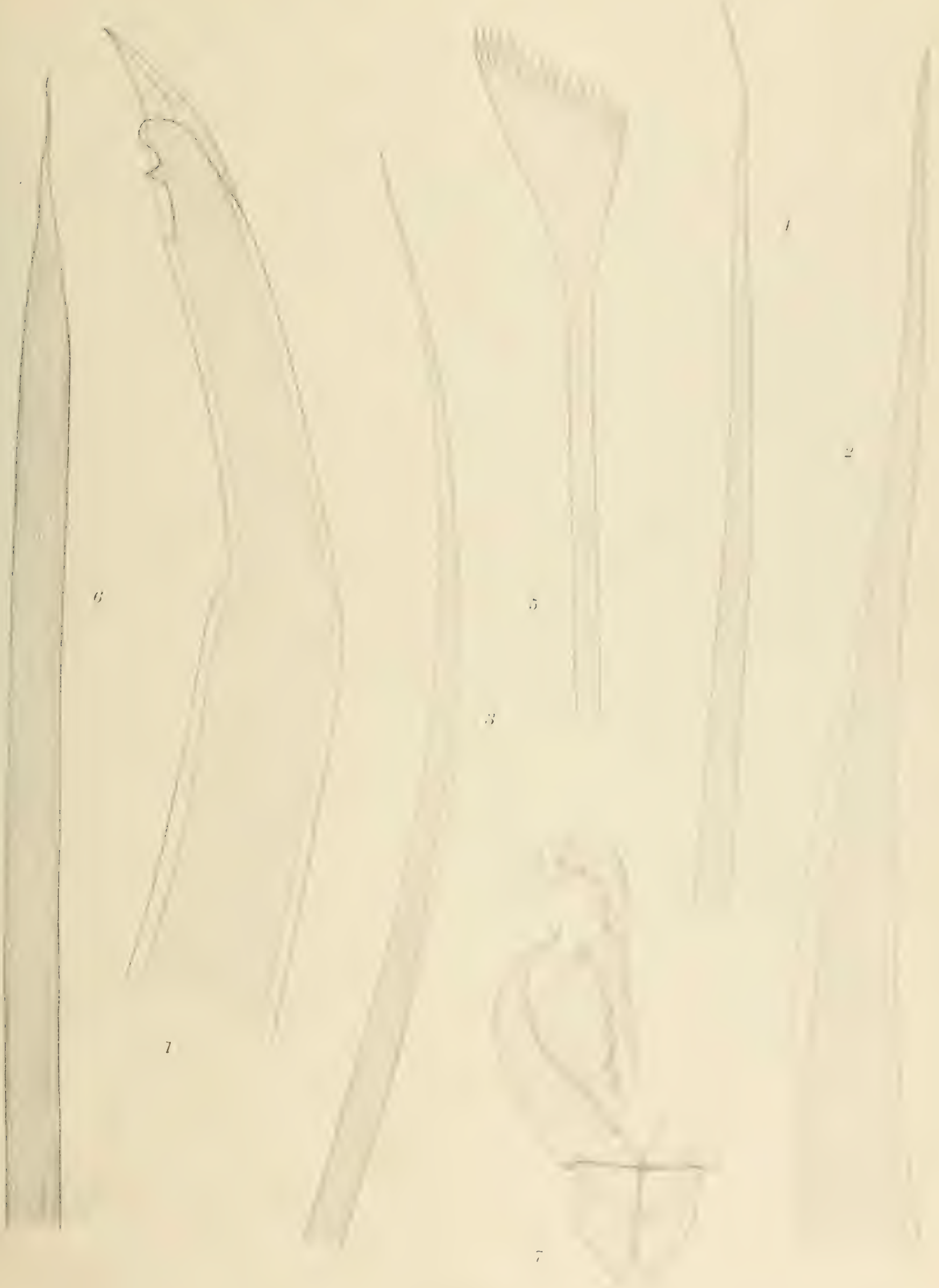


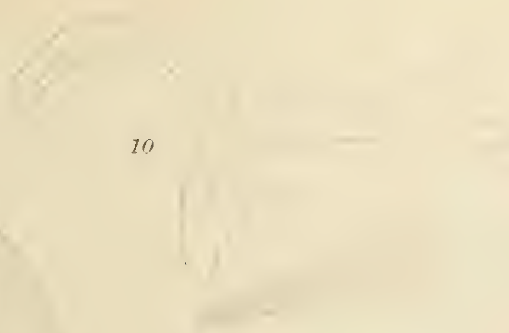
PLATE 51.

PLATE 51.

Onuphis litabranchia Chamberlin.

Figures 1–10.

1.— Anterior end, ventral view. × 27.
2.— Distal end of aciculum from middle region. × 437.
3.— Distal end of limbate seta from middle region. × 437.
4.— Distal end of pectinate seta from middle region of body. × 1075.
5.— Distal end of crochet from middle region of body. × 437.
6.— Distal end of special crochet from second parapodium. × 1075.
7.— First parapodium, caudoectal view. × 63.
8.— First branchia with notocirrus, subectal view. × 63.
9.— Sixth branchia with notocirrus. × 63.
10.— Thirteenth right branchia with notocirrus and dorsal setae. × 63.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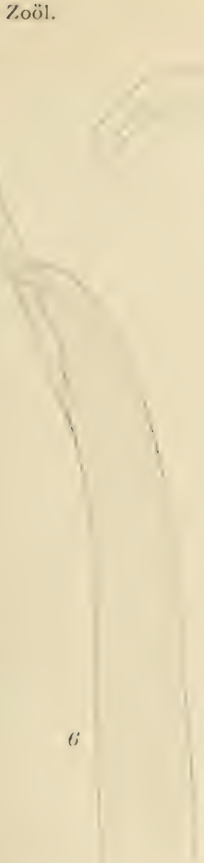
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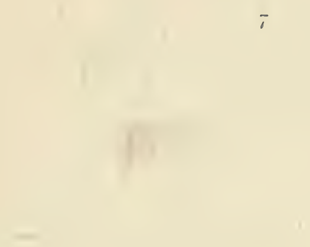
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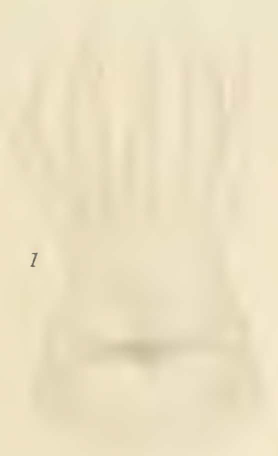
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PLATE 52.

PLATE 52.

Onuphis litabranchia CHAMBERLIN.

Figure 1.

1.— Branchia with cirrus from anterior middle region. × 63.

Onuphis cobra CHAMBERLIN.

Figures 2-8.

2.— Mandibles, with distal portion of masticatory plates broken off. × 27.
3.— Maxillae. × 27.
4.— Distal end of aciculum from posterior region.
5.— Limbate seta of posterior region, not quite full side view. × 429.
6.— Pectinate seta with corners not inflexed. × 429.
7.— Ordinary crochet from posterior region. × 429.
8.— Special crochet from first parapodium, guard broken off. × 429.

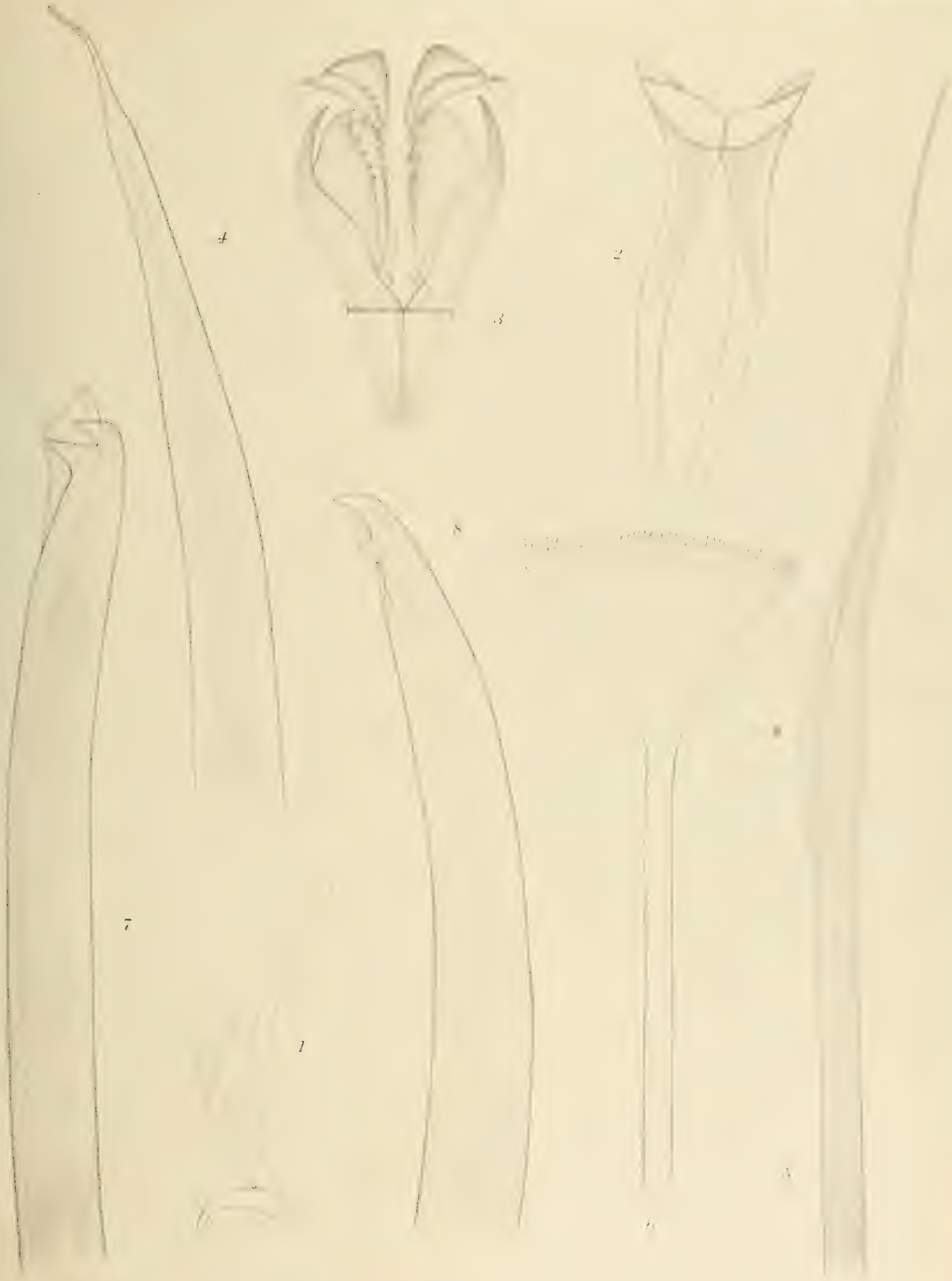

PLATE 53.

PLATE 53.

Leodice makemoana CHAMBERLIN.

Figures 1–11.

1.— Anterior dorsal region, lateral view. × 51.
2.— Mandibles, ventral view. × 72.
3.— First maxillae, with left blade incomplete. × 72.
4.— Pectinate seta from caudal region. × 1232.
5.— Distal portion of composite seta from anterior region. × 1232.
6.— Distal end of crochet from posterior region. × 493.
7.— First branchia with notocirrus, ectodorsal view. × 72.
8.— Tenth branchia with notocirrus, ectodorsal view. × 72.
9.— Eighth from last branchia with notocirrus, subanterior view. × 72.
10.— Antepenult branchia and notocirrus, anterior view. × 72.
11.— Last branchia and notocirrus. × 72.

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PLATE 54.

PLATE 54.

Leodice segregata Chamberlin.

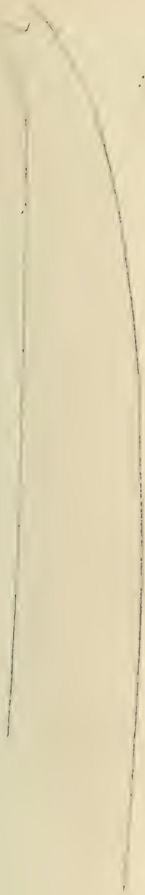
Figures 1–5.

1.— Maxillae I and II of left side. × 25.
2.— Pectinate seta. × 1232.
3.— Distal end of crochet of posterior region. × 319.
4.— Branchia of eleventh somite with notocirrus. × 25.
5.— Branchia and notocirrus of second to last branchiferous somite (paratype from Sta. 3417). × 25.

Leodice lita Chamberlin.

Figures 6–10.

6.— First branchia, with notocirrus of eighteenth somite. × 72.
7.— Third branchia, with notocirrus. × 72.
8.— Fifth branchia, with notocirrus. × 72.
9.— Tenth branchia, with notocirrus. × 72.
10.— Twelfth branchia, with notocirrus. × 72.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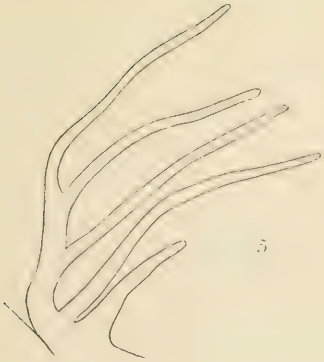
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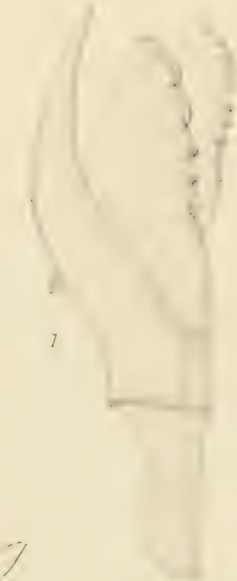
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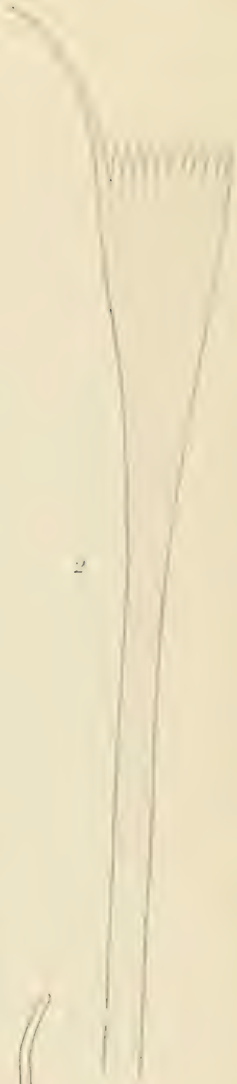
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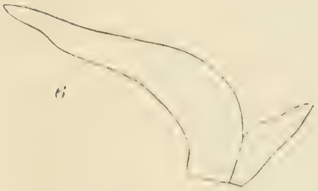
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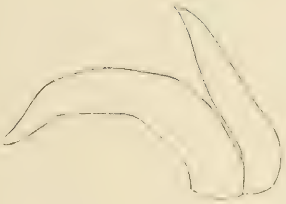
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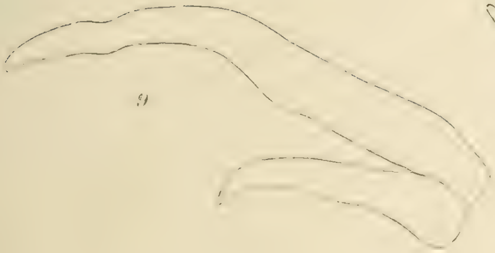
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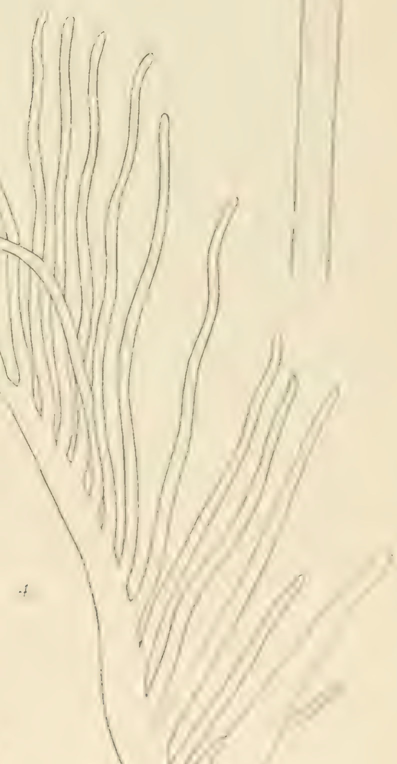
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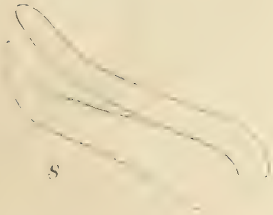
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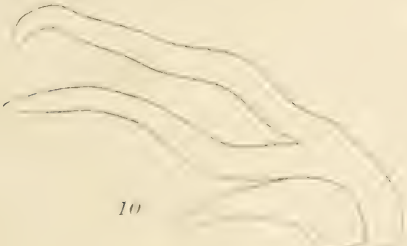
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PLATE 55.

PLATE 55.

Leodice lita CHAMBERLIN.

Figures 1–7.

1.— Thirty first branchia and notocirrus, subdorsal view. × 72.
2.— Mandibles, ventral view. × 31.
3.— Maxillae I. × 31.
4.— Distal portion of aciculum from middle region showing the common form of apex. × 319.
5.— Crochet. × 298.
6.— Shaft and appendage of composite seta. × 319.
7.— Pectinate seta. × 1232.

Leodice oliga papeetensis CHAMBERLIN.

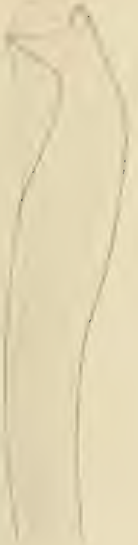
Figures 8–10.

8.— First branchia with notocirrus. × 72.
9.— Sixth branchia with notocirrus, caudal view. × 72.
10.— Nineteenth branchia with notocirrus, anterodorsal view. × 72.

Leodice oliga CHAMBERLIN.

Figure 11.

11.— Apical portion of crochet. × 493.



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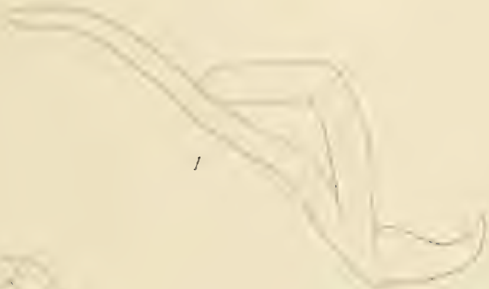

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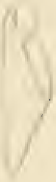

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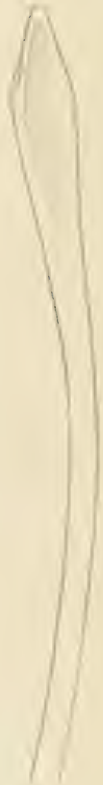

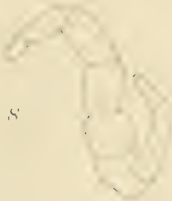

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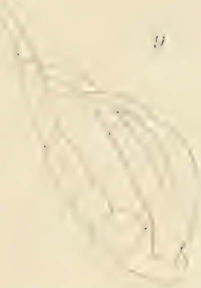

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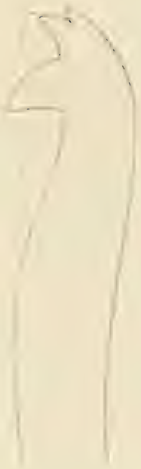

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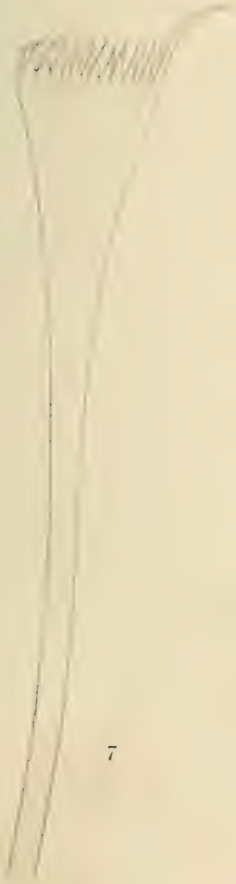

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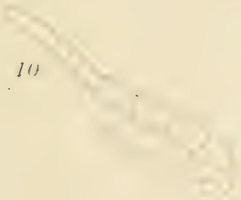

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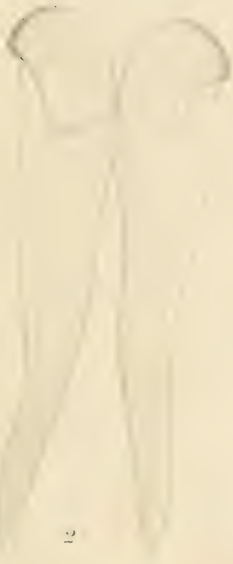

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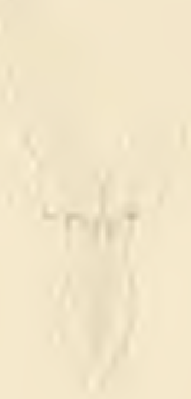

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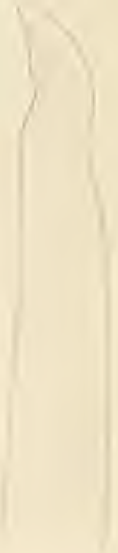

PLATE 56.

PLATE 56.

Leodice oliga papeetensis CHAMBERLIN.

Figure 1.

1.— Twenty sixth branchia. × 74.

Leodice oliga CHAMBERLIN.

Figures 2–9.

2.— Mandibles, ventral view. × 74.
3.— Pectinate seta. × 1261.
4.— Composite seta. × 1261.
5.— First branchia, with notocirrus. × 74.
6.— Second branchia in caudal group, with notocirrus. × 74.
7.— Fourth branchia, with notocirrus, dorsocaudal view. × 74.
8.— Sixth branchia, with notocirrus, subcaudal view. × 74.
9.— Probably eighth branchia, subcaudal view. × 74.

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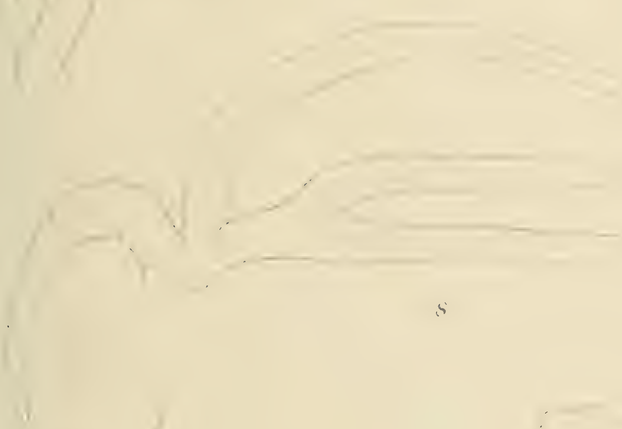
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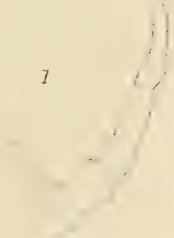
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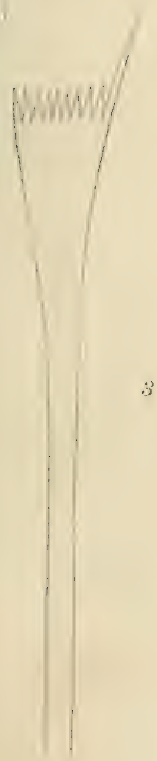
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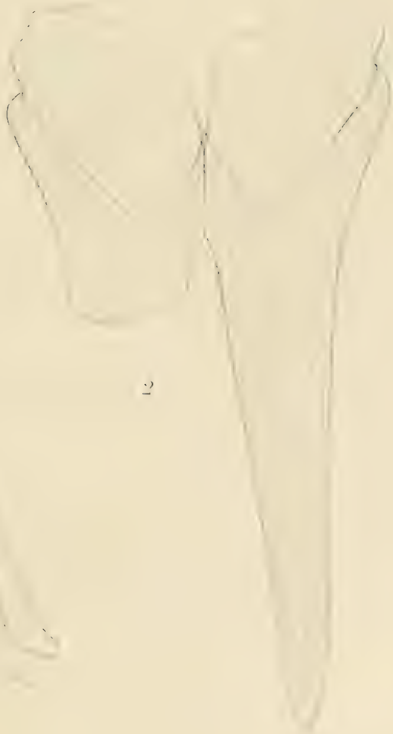
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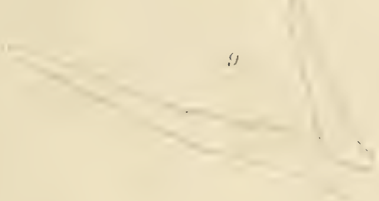
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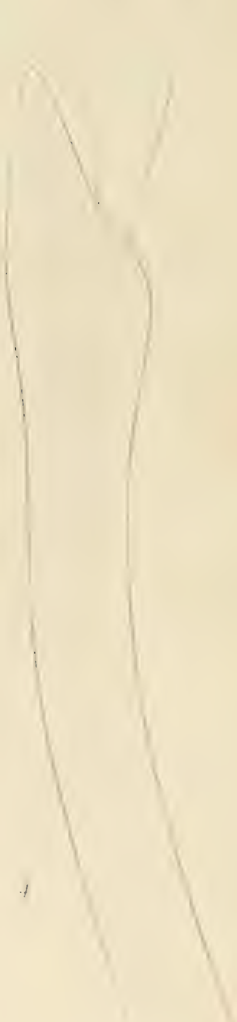
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PLATE 57.

PLATE 57.

Leodice contingens Chamberlin.

Figures 1–5.

1.— Maxillae I and II, left side, dorsal view. × 17.
2.— Right branchia with notocirrus of twenty fourth somite. × 24.
3.— Distal portion of dorsal seta. × 326.
4.— Distal end of crochet from posterior region. × 326.
5.— Composite seta from caudal region. × 326.

Leodice nesiotes Chamberlin.

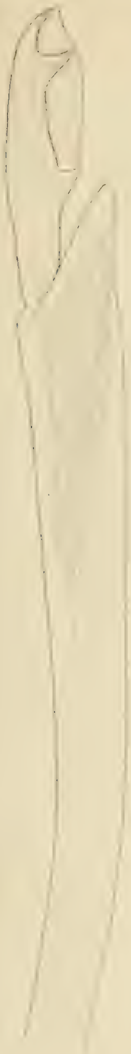
Figures 6, 7.

6.— Right mandible, ventral view. × 23.
7.— Composite seta, thirtieth somite. × 298.

Leodice pauroneurata Chamberlin.

Figures 8, 9.

8.— Pectinate seta. × 1261.
9.— Composite seta. × 326.



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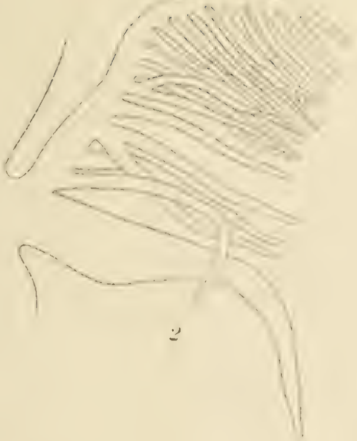

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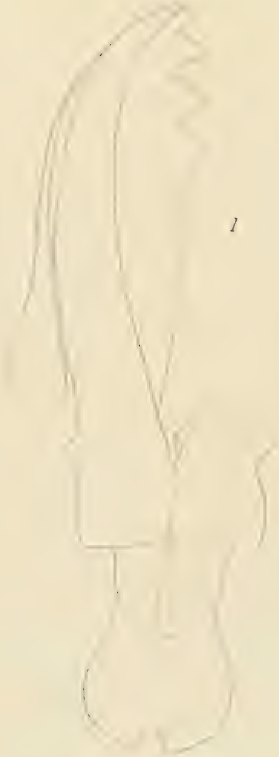

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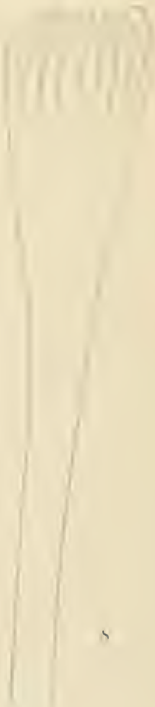

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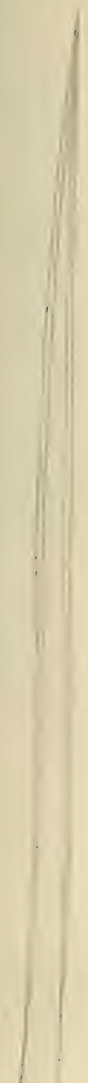

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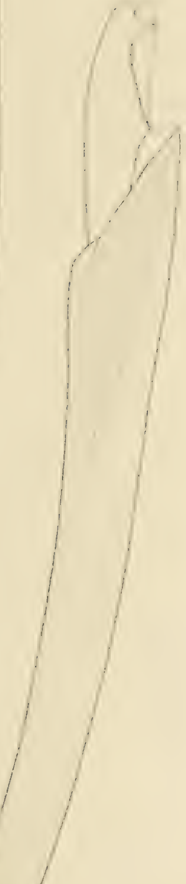

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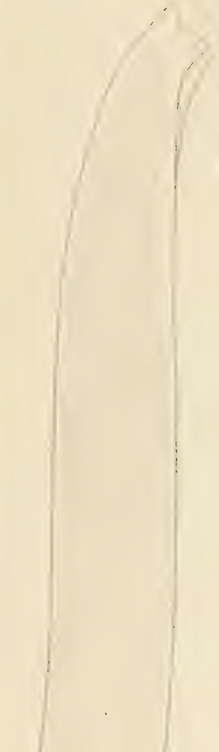

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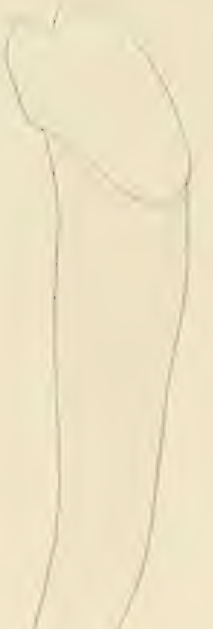

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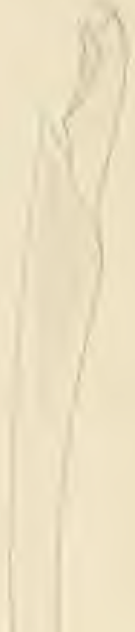

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PLATE 58.

PLATE 58.

Leodice pauroneurata CHAMBERLIN.

Figures 1-9.

1.— Crochet from posterior region. × 319.
2.— Mandibles. × 26.
3.— Right maxilla I. × 26.
4.— Maxilla III, dorsal view. × 31.
5.— Paired tentacles of right side, lateral view. × 25.
6.— Tentacular cirrus. × 46.
7.— First left branchia, with notocirrus, caudal view. × 57.
8.— Fourth left branchia, with notocirrus, caudal view. × 57.
9.— Eleventh left branchia, with notocirrus, caudal view. × 57.

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PLATE 59.

PLATE 59.

Leodice pauroneurata Chamberlin.

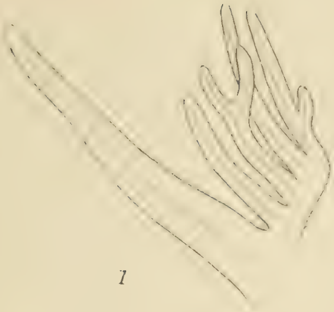
Figures 1–3.

1.— Thirteenth branchia, with notocirrus, caudal view. × 58.
2.— Thirty second branchia, with notocirrus, caudal view. × 58.
3.— Fifty fourth branchia, with notocirrus, caudal view of sixty third somite. × 58.

Leodice panamena Chamberlin.

Figures 4–8.

4.— First right branchia, anterior view. × 46.
5.— Second right branchia, subdorsal view. × 46.
6.— Sixth right branchia, subdorsal view. × 46.
7.— Eleventh right branchia, subdorsal view. × 46.
8.— Sixty first right branchia, subdorsal view. × 46.



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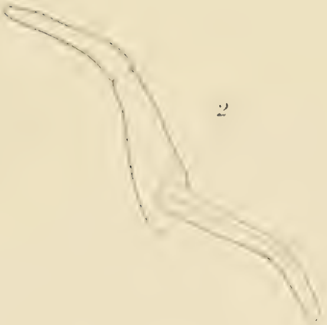

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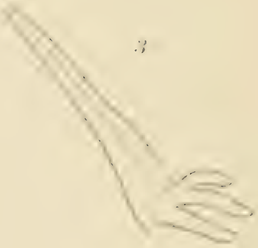

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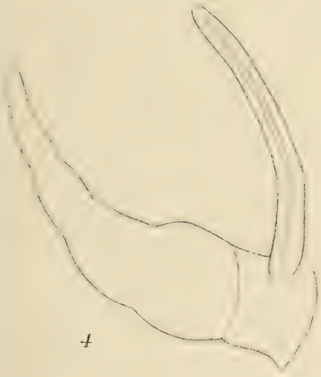

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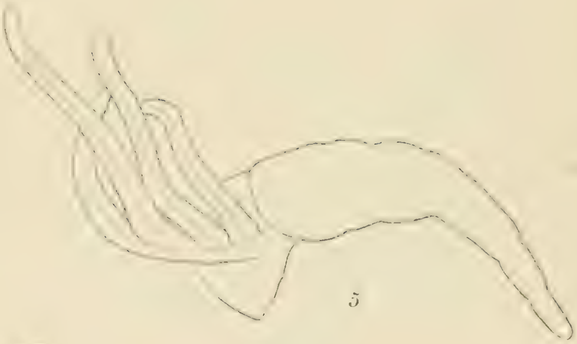

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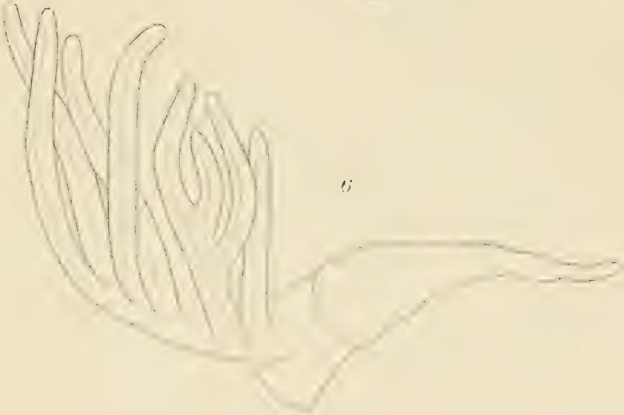

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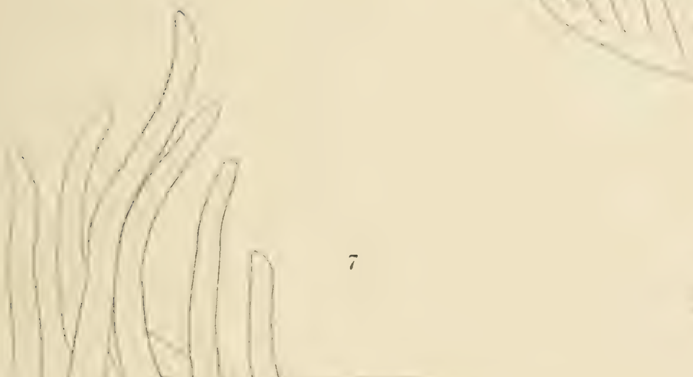

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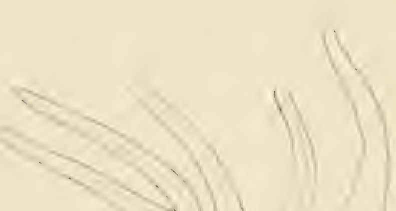

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PLATE 60.

PLATE **60**.

Leodice panamena Chamberlin.

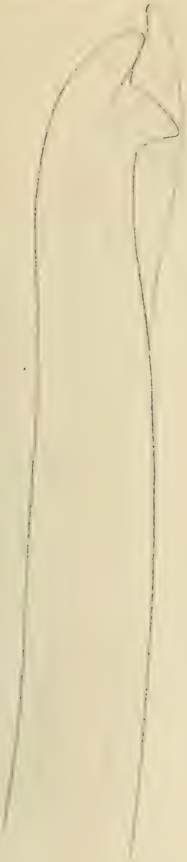
Figures 1-5.

1.— Distal portion of crochet from fifty sixth somite. × 504.
2.— Composite seta from fifty sixth somite. × 1261.
3.— Pectinate seta from fifty sixth somite. × 1261.
4.— Mandibles, ventral view. × 31.
5.— Maxillae I, dorsal view. × 31.

Lumbrinereis bifilaris Ehlers.

Figures 6-9.

6.— Mandibles, ventral view.
7.— Maxillae II, III, and IV.
8.— Distal end of limbate seta of fifteenth somite.
9.— The same, of another seta of same somite, different view.



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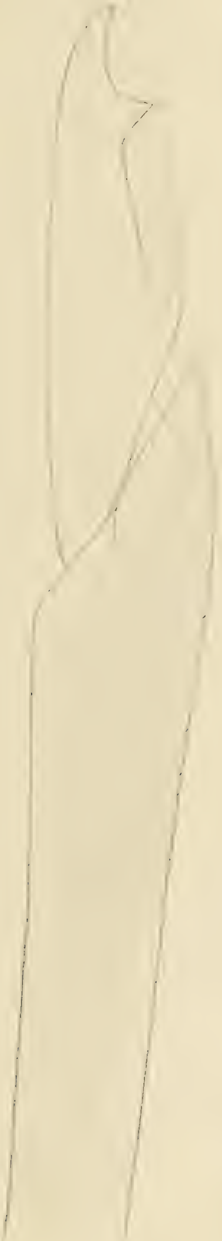

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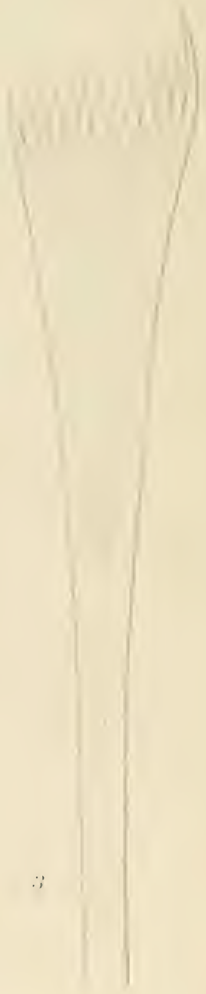

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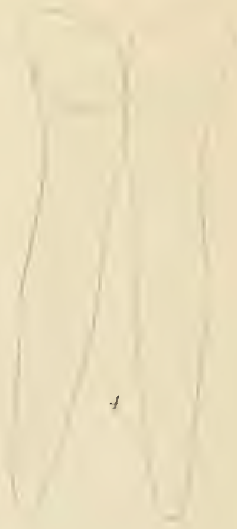

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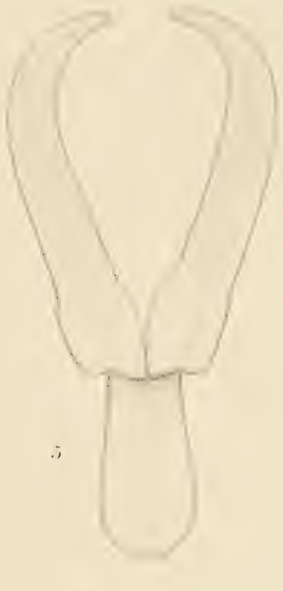

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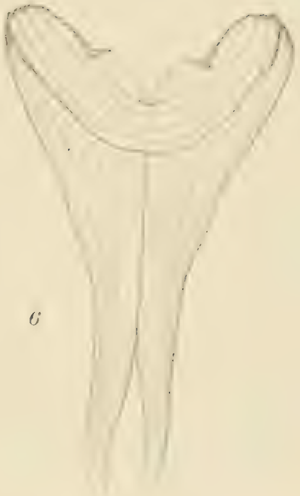

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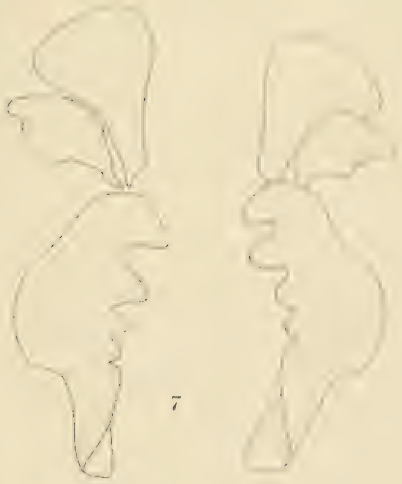

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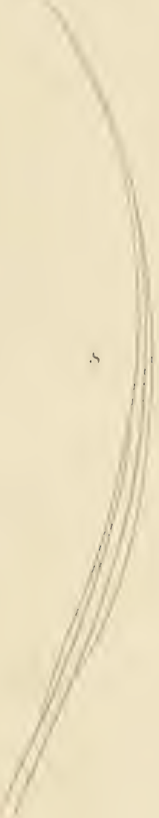

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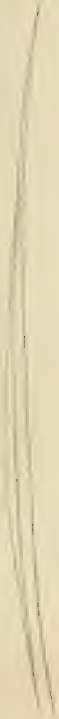

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PLATE 61.

PLATE 61.

Lumbrinereis bifilaris EHLERS.

Figure 1.

1.— Crochet, from caudal region.

Cenothrix mutans CHAMBERLIN.

Figures 2–9.

2.— Maxillae, dorsal view. × 76.
3.— Mandibles. × 76.
4.— Anterior region of body, ventral view. × 32.
5.— Dorsal seta and aciculum of middle region. × 495.
6.— Crochet, viewed from edge. × 495.
7.— Another crochet, side view. × 495.
8.— Limbate seta of first type from middle region. × 495.
9.— Parapodium from middle region, anterior view. × 117.

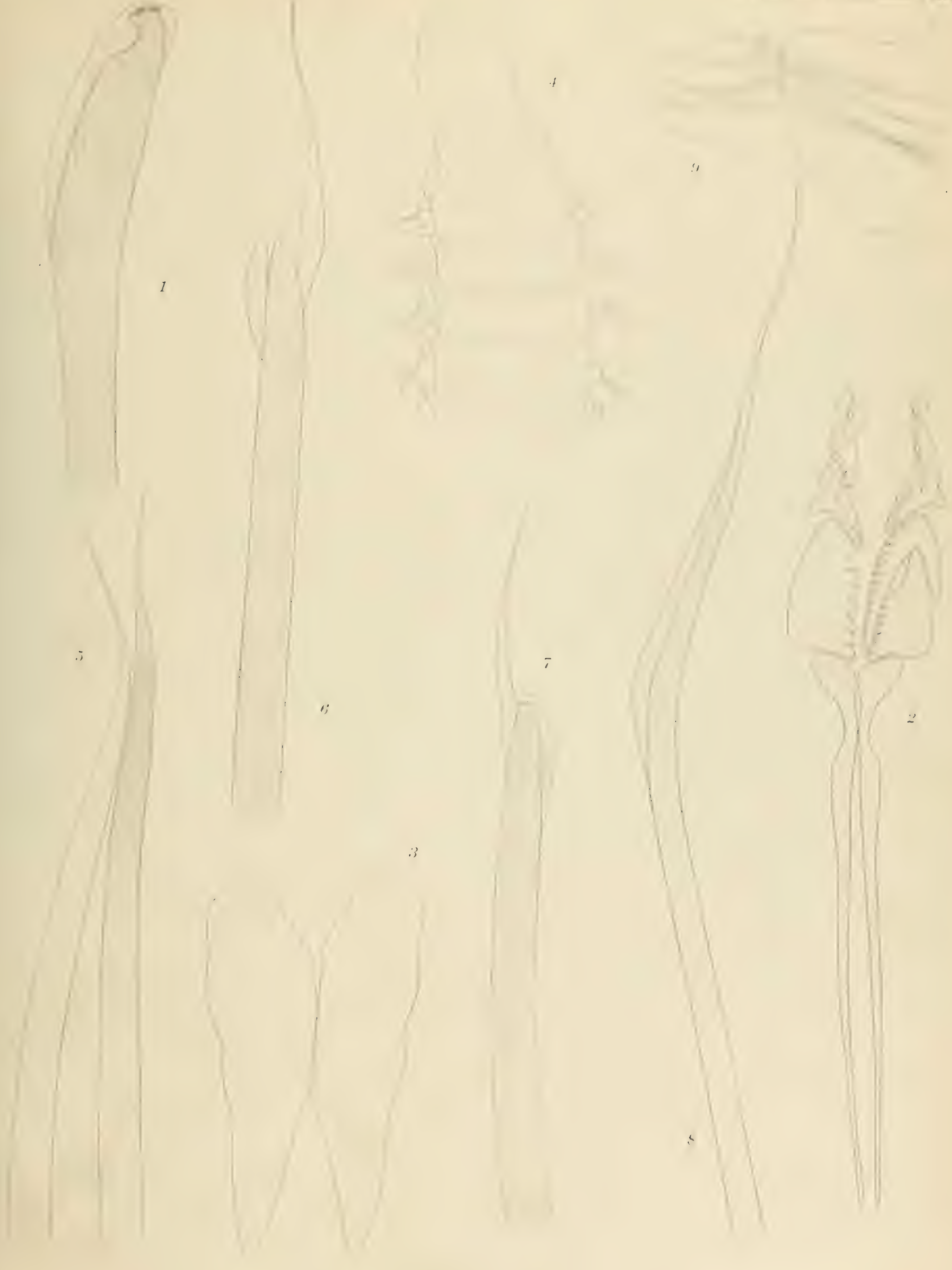


PLATE 62.

PLATE 62.

Cenothrix mutans CHAMBERLIN.

Figure 1.

1.— Limbate seta of second type. × 412.

Oenone telura CHAMBERLIN.

Figures 2–5.

2.— Maxillae, dorsal view. × 64.
3.— Anterior end, ventral view (proboscis omitted). × 27.
4.— Parapodium of middle region, caudal view. × 64.
5.— Crochet. × 412.

Dorvillea crassa CHAMBERLIN.

Figures 6, 7.

6.— Mandibles. × 27.
7.— Simple dorsal seta. × 1087.

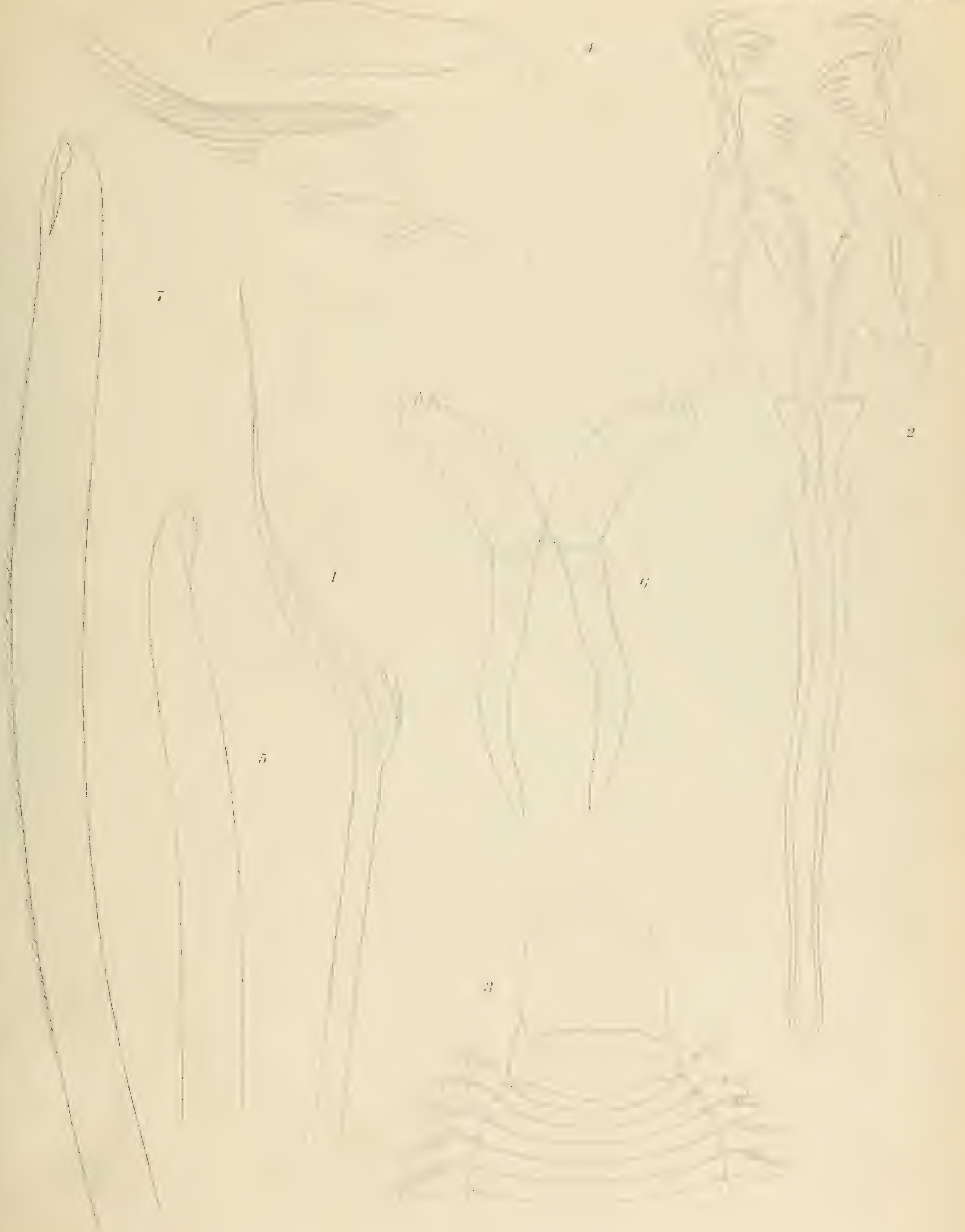


PLATE **63**

PLATE 63.

Dorvillea crassa Chamberlin.

Figure 1.

1.— Composite seta, distal portion. × 1075.

Hemipodus mexicanus Chamberlin.

Figures 2, 3.

2.— Twelfth parapodium, caudal view. × 63.
3.— Composite seta, distal portion. × 1075.

Telake epipolasis Chamberlin.

Figures 4-8.

4.— Twenty first parapodium. × 63.
5.— Thirty seventh parapodium. × 63.
6.— Distal portion of notopodial seta of twenty first parapodium. × 1075.
7.— Tip of neuropodial seta of thirty seventh parapodium. × 1075.
8.— Portion of same seta at proximal end of free part. × 1075.

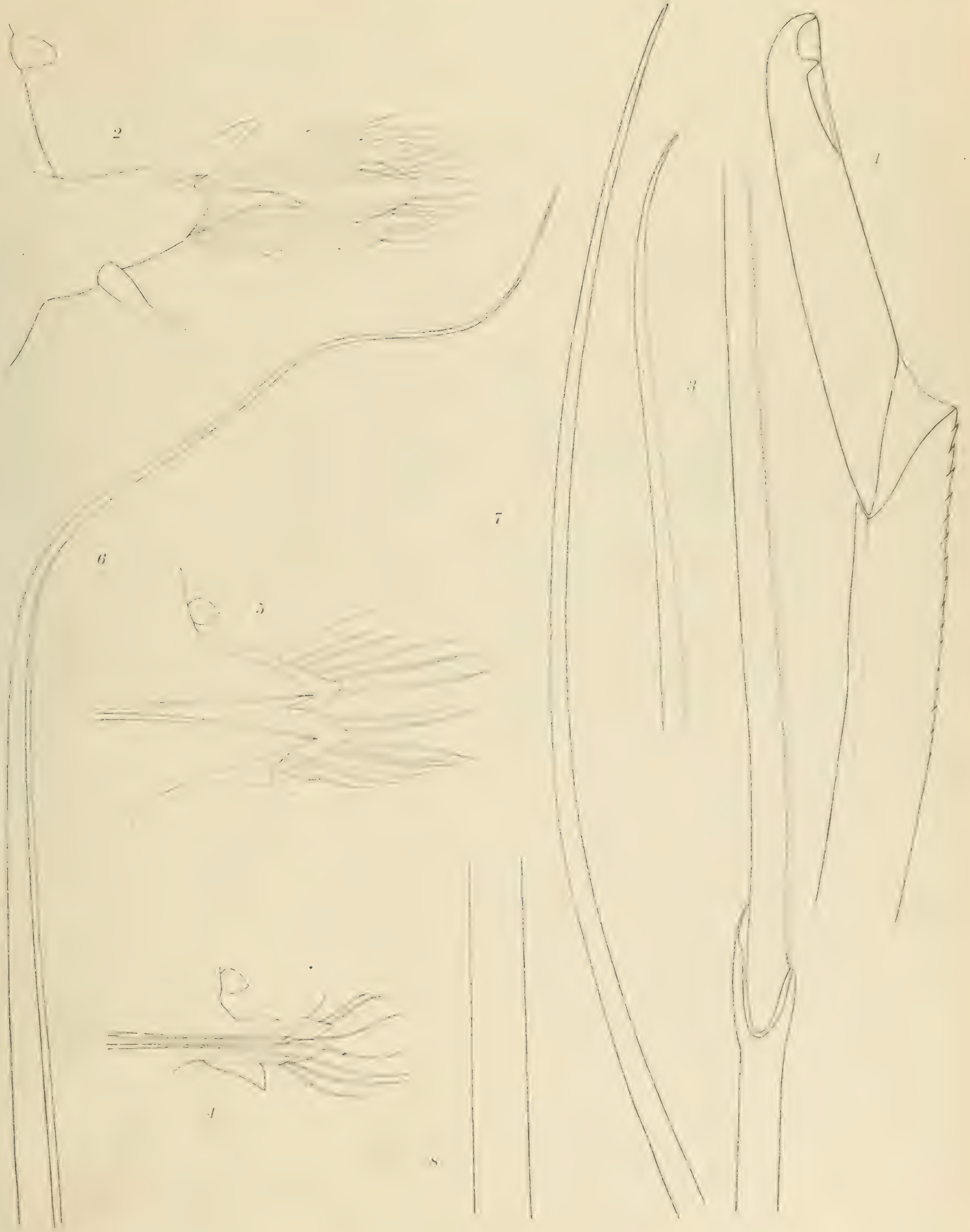


PLATE 64.

PLATE 64.

Telake epipolasis CHAMBERLIN.

Figure 1.

1.— Distal portion of ventral seta of twenty first parapodium. × 811.

Glycera profundi CHAMBERLIN.

Figures 2–6.

2.— Prostomium. × 26.
3.— Fourth parapodium, caudal view. × 50.
4.— Twentieth parapodium, caudal view. × 50.
5.— Fiftieth parapodium, cephalic view. × 50.
6.— One hundredth parapodium, cephalic view. × 50.

Branchethus latum CHAMBERLIN.

Figures 7–11.

7.— Sixth branchia. × 49.
8.— Tenth branchia. × 49.
9.— Basal portion of thirtieth branchia with all filaments broken off near base, subdorsal view. × 49.
10.— Branchia from caudal region. × 49.
11.— Branchia from caudal region, a broader form. × 49.

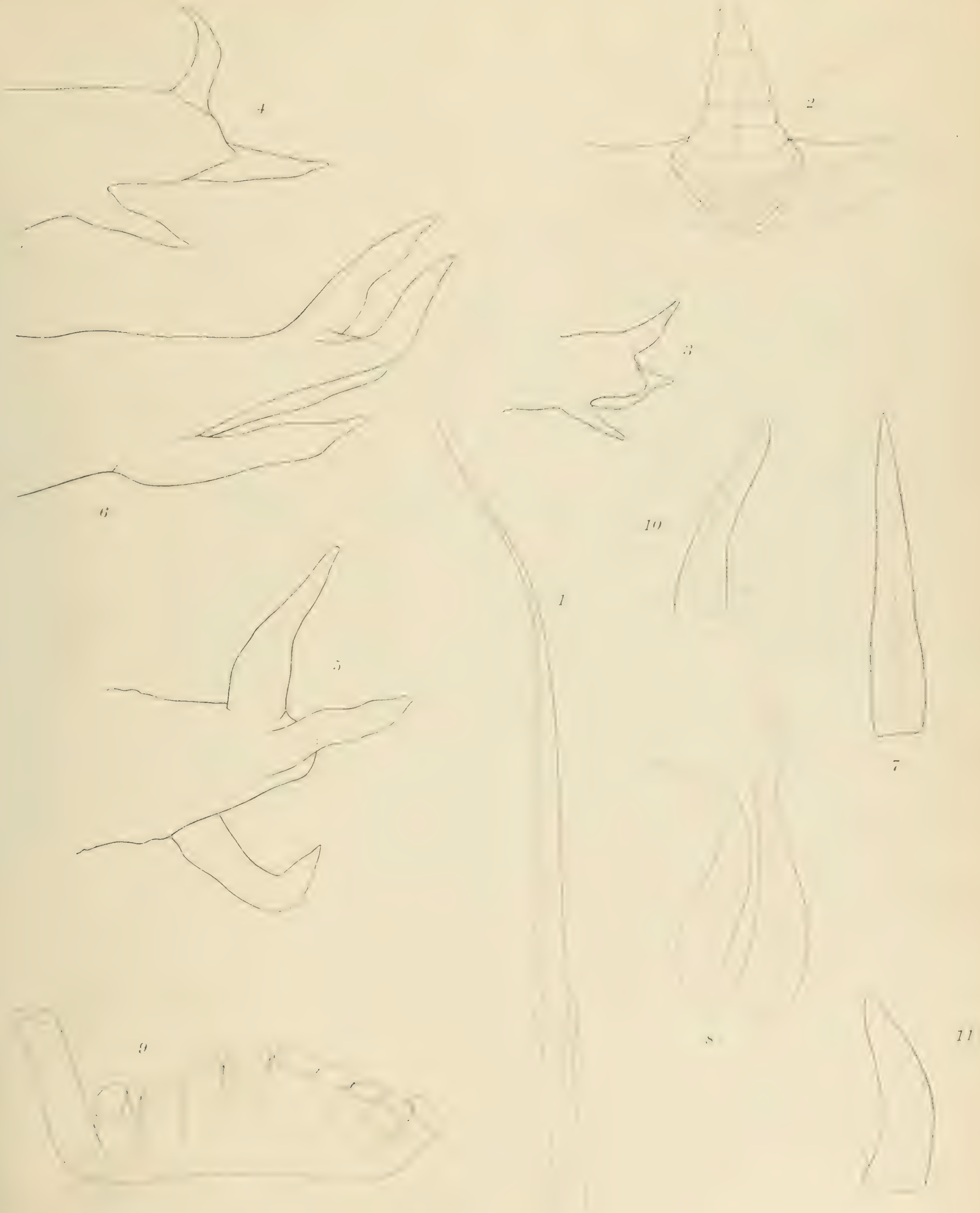


PLATE 65.

PLATE 65.

Branchethus latum Chamberlin.

Figures 1, 2.

1.— Neuropodial seta of anterior parapodium. × 278.
2.— Portion of notopodial seta of anterior parapodium. × 278.

Nainereis retusiceps Chamberlin.

Figures 3–5.

3.— Tenth parapodium, anterior view. × 63.
4.— Ventral neuropodial seta, tenth parapodium. × 278.
5.— Ordinary neuropodial seta, tenth parapodium. × 278.

Plotobia simplex Chamberlin.

Figures 6–11.

6.— Style of first right notocirrus. × 63.
7.— Style of second right notocirrus. × 63.
8.— Style of third right notocirrus. × 63.
9.— Style of fifteenth right notocirrus. × 63.
10.— Style of last right notocirrus. × 63.
11.— Style of neurocirrus of about fifteenth setigerous somite. × 63.

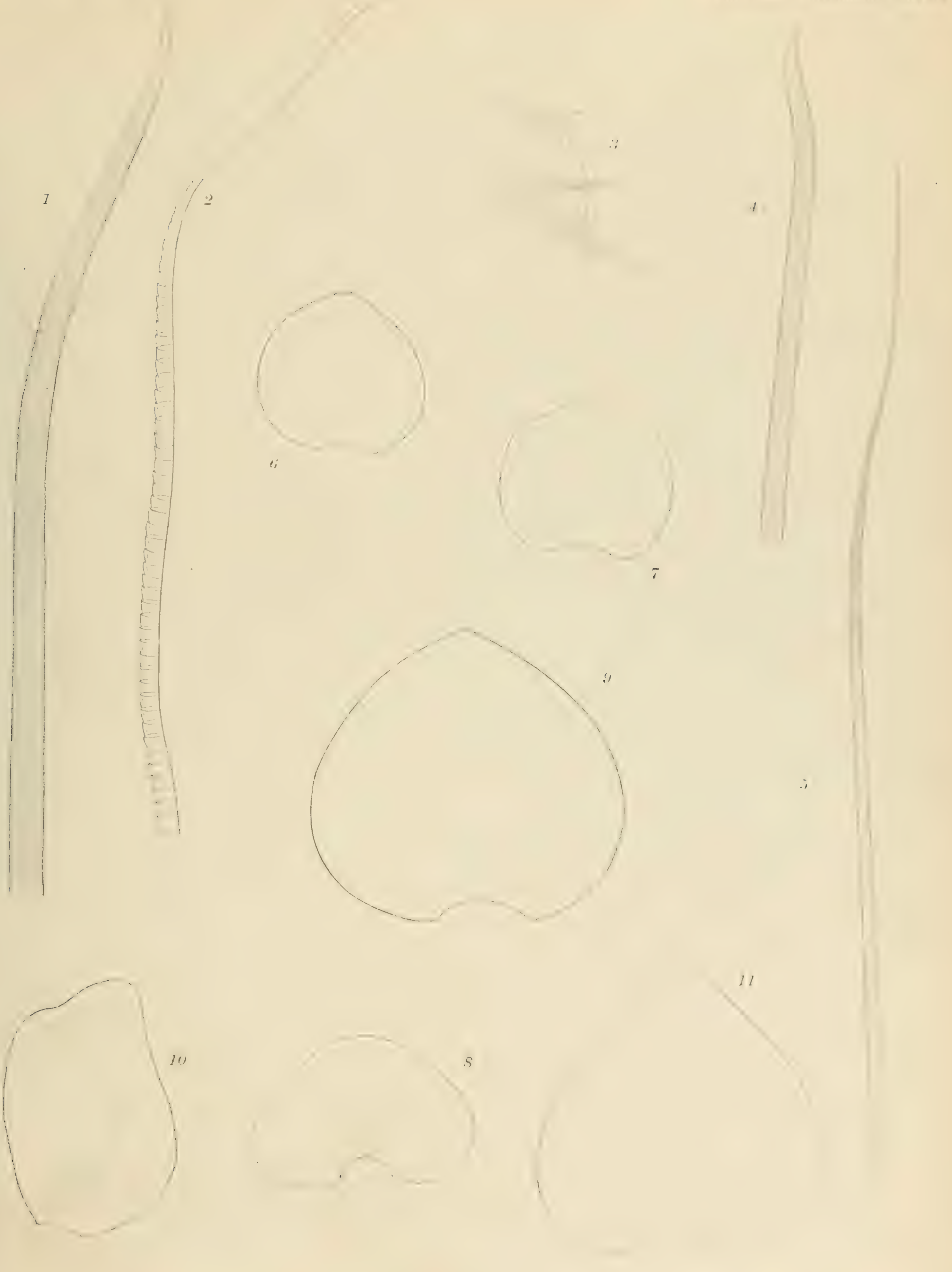


PLATE 66.

PLATE 66.

Plotobia simplex CHAMBERLIN.

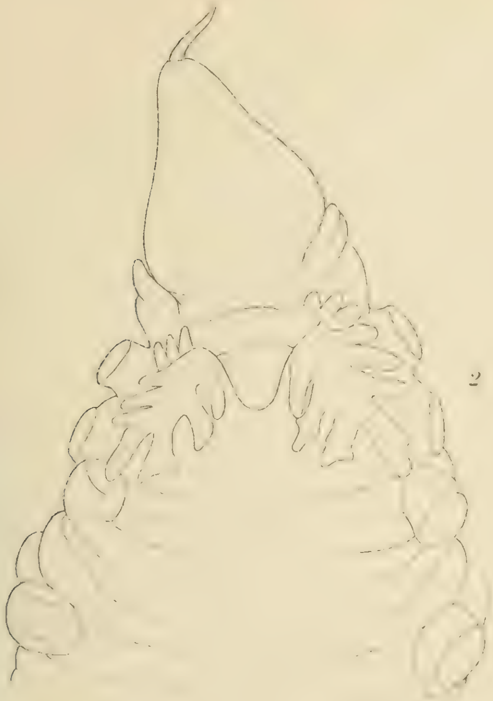
Figure 1.

1.— Anterior end seen from above and a little to the right (styles of left notocirri, excepting the first one, missing).

Plotobia coniceps CHAMBERLIN.

Figures 2-4.

2.— Anterior end, dorsal view (paratype, Sta. 4661). × 32.
3.— Anterior end, lateral view, styles of cirri missing (type). × 32.
4.— Caudal end, dorsal view (paratype). × 32.



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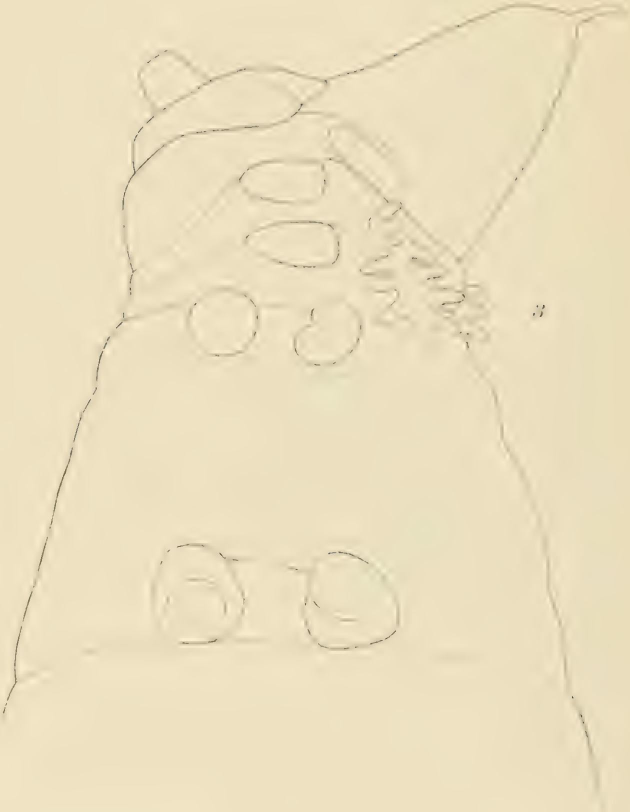

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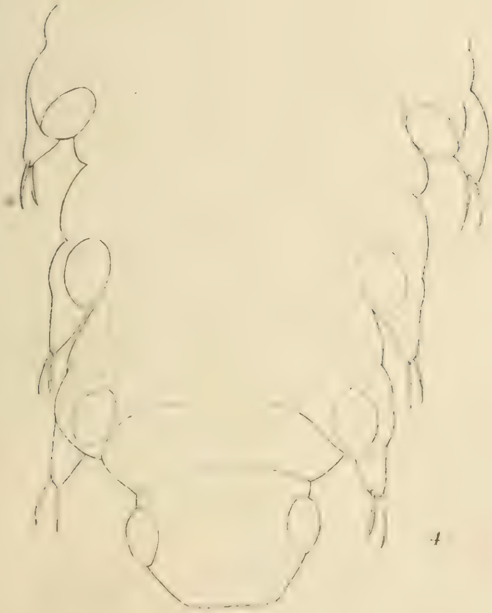

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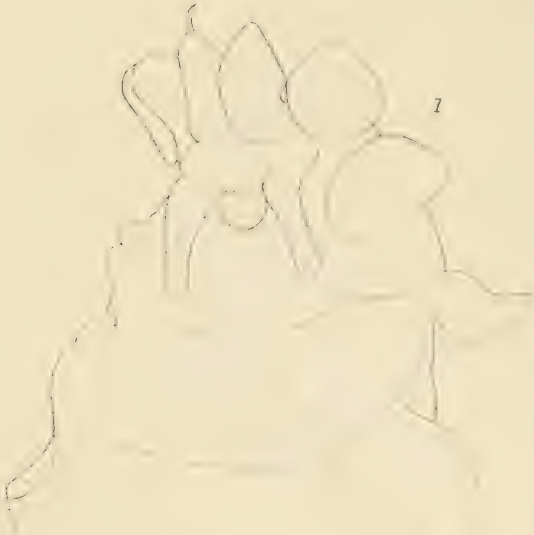

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PLATE 67.

PLATE 67.

Travisia profundi CHAMBERLIN.

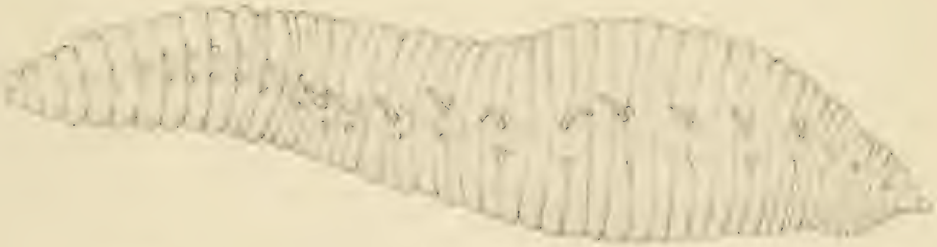
Figures 1–4.

1.— Lateral view.
2.— Anterior end, ventral view. × 32.
3.— Portion of third somite showing first branchia, setae, sensory pit. × 76.
4.— Branchia and adjoining structures of eighth somite. × 76.

Kesun fusus CHAMBERLIN.

Figure 5.

5.— Portion of fourth somite showing setae, sensory pit, etc. × 76.



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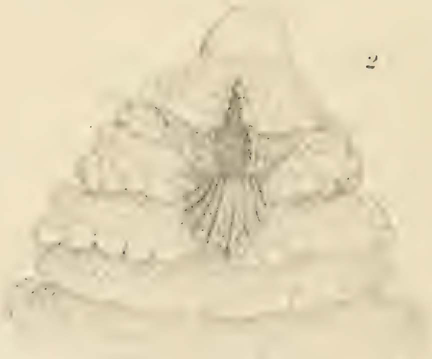

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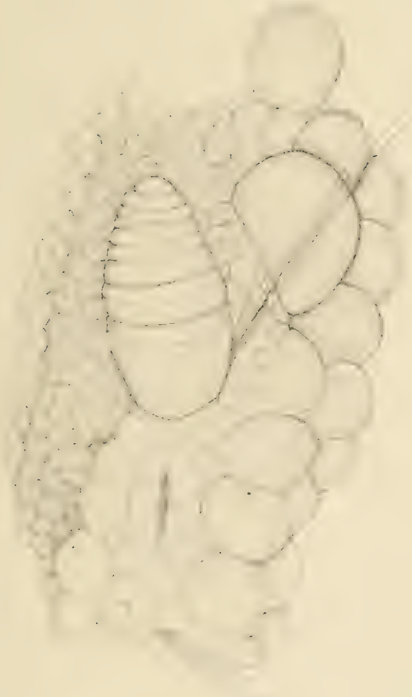

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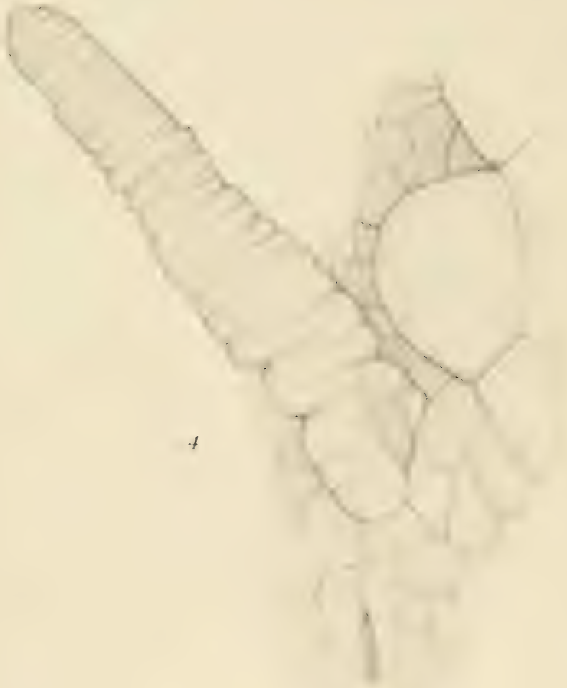

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PLATE 68.

PLATE 68.

Kesun fusus CHAMBERLIN.

Figures 1, 2.

1.— Anterior end, ventral view. × 38.
2.— Caudal end, lateral view. × 38.

Brada verrucosa CHAMBERLIN.

Figures 3-6.

3.— Palpus, ventral view. × 35.
4.— Seta of neuropodium of twentieth somite. × 76.
5.— Seta of notopodium of eleventh somite. × 76.
6.— Notopodial seta of eleventh somite; *a*. base, *b*. toward tip. × 337.

Brada irenaia CHAMBERLIN.

Figures 7-9.

7.— Notopodial seta of thirteenth somite. × 76.
8.— Portion toward distal end of same seta. × 337.
9.— Portion toward base of same seta. × 337.

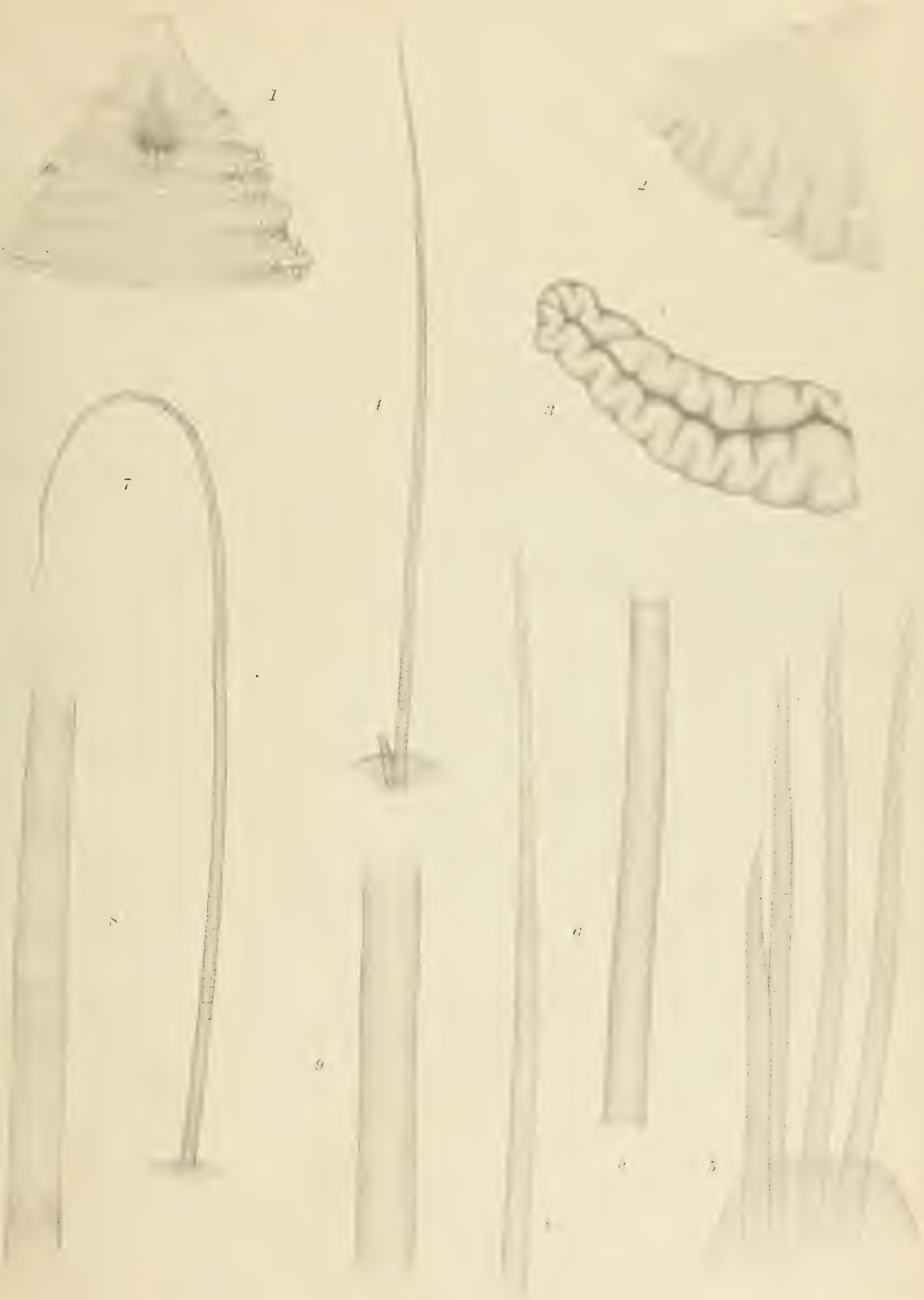
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PLATE 69.

PLATE 69.

Brada irenaia Chamberlin.

Figures 1–3.

1.— Neuropodial seta from thirteenth somite. × 76.
2.— Portion from basal region of neuropodial seta of the more common form, sixteenth somite. × 337.
3.— Similar portion from neuropodial seta with exceptionally short annuli. × 337.

Ilyphagus bythincola Chamberlin.

Figures 4–9.

4.— Notopodial seta of eleventh somite. × 76.
5.— Portion of same toward tip. × 337.
6.— Portion of same at base. × 337.
7.— Neuropodial seta from eleventh somite. × 76.
8.— Portion of same at base. × 337.
9.— Portion of neuropodial seta near middle from tenth somite. × 337.

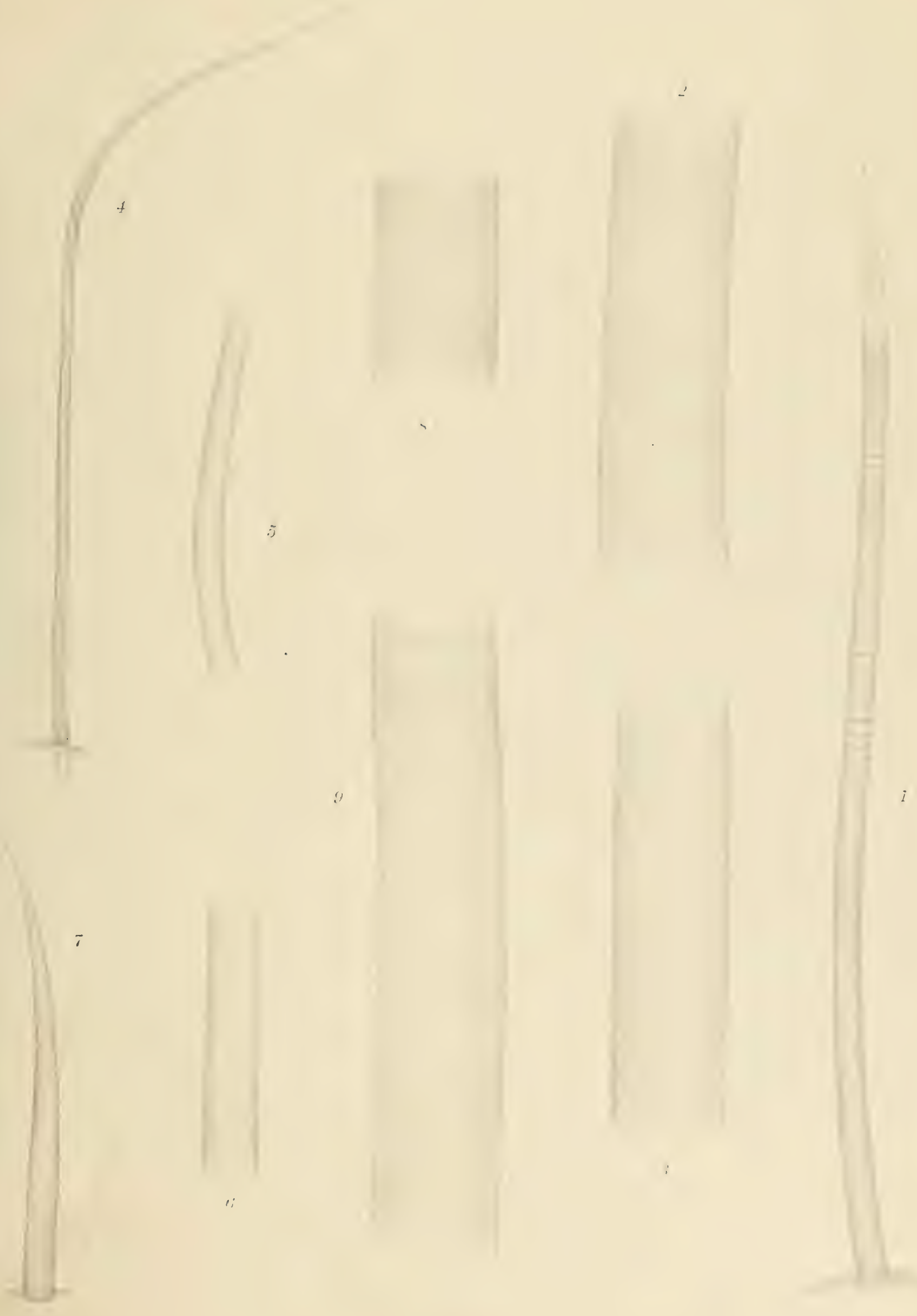


PLATE 70.

PLATE 70.

Cirratulus megalus Chamberlin.

Figures 1–4.

1.— Anterior end, dorsal view. × 7.5.
2.— Anterior end, ventral view. × 7.5.
3.— Two ventral spines and one capillary seta. × 63.
4.— Portion of capillary seta. × 1036.

Cirrineris nesiotes Chamberlin.

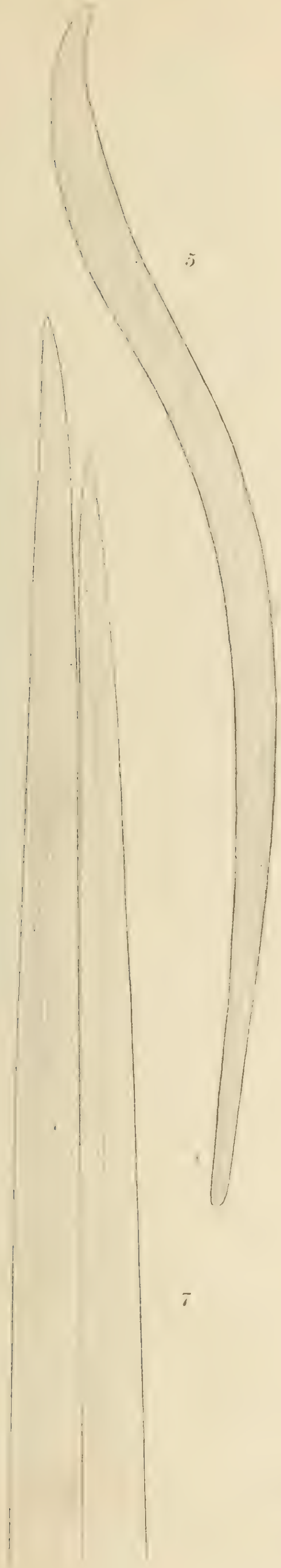
Figures 5, 6.

5.— Ventral spine. × 278.
6.— Ventral capillary seta. × 278.

Cirratulus sinincolens Chamberlin.

Figures 7–10.

7.— Neuropodial acicula from posterior region, proximal ends not shown. × 278.
8.— Distal portion of single ventral spine of same parapodium. × 278.
9.— Ordinary seta, anterior region. × 278.
10.— Finer dorsal neuropodial seta, posterior region. × 278.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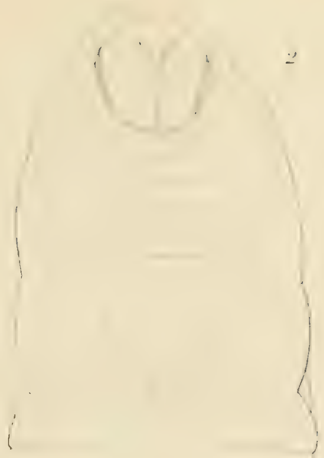
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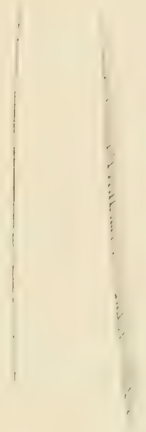
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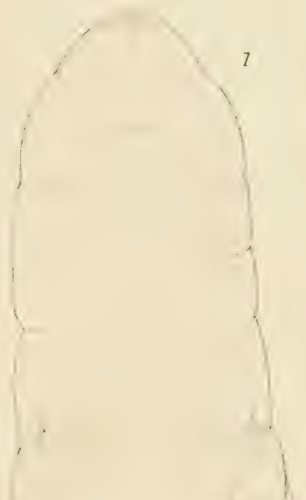
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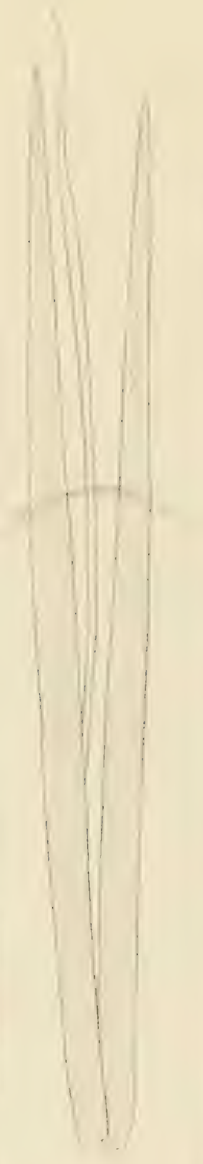
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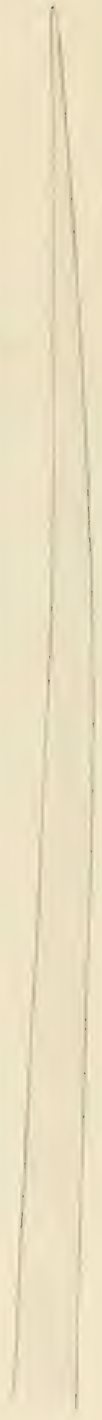
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PLATE 71.

PLATE **71**.

Sonatsa meridionalis CHAMBERLIN.

Figures 1–8.

1.— Anterior end, lateral view. × cir. 8.5.
2.— Anterior region, dorsal view. × cir. 8.5.
3.— Region of fifth, sixth, and seventh somites, lateral view.
4.— Uncinus of eighth somite. × 337.
5.— Distal end of uncinus, or crochet, of third setigerous somite. × 1150.
6.— Distal end of crochet of eighth setigerous somite. × 1150.
7.— Beginning of serrate portion of capillary setae from middle region. × cir. 1150.
8.— Limbate seta of third setigerous somite. × cir. 1300.

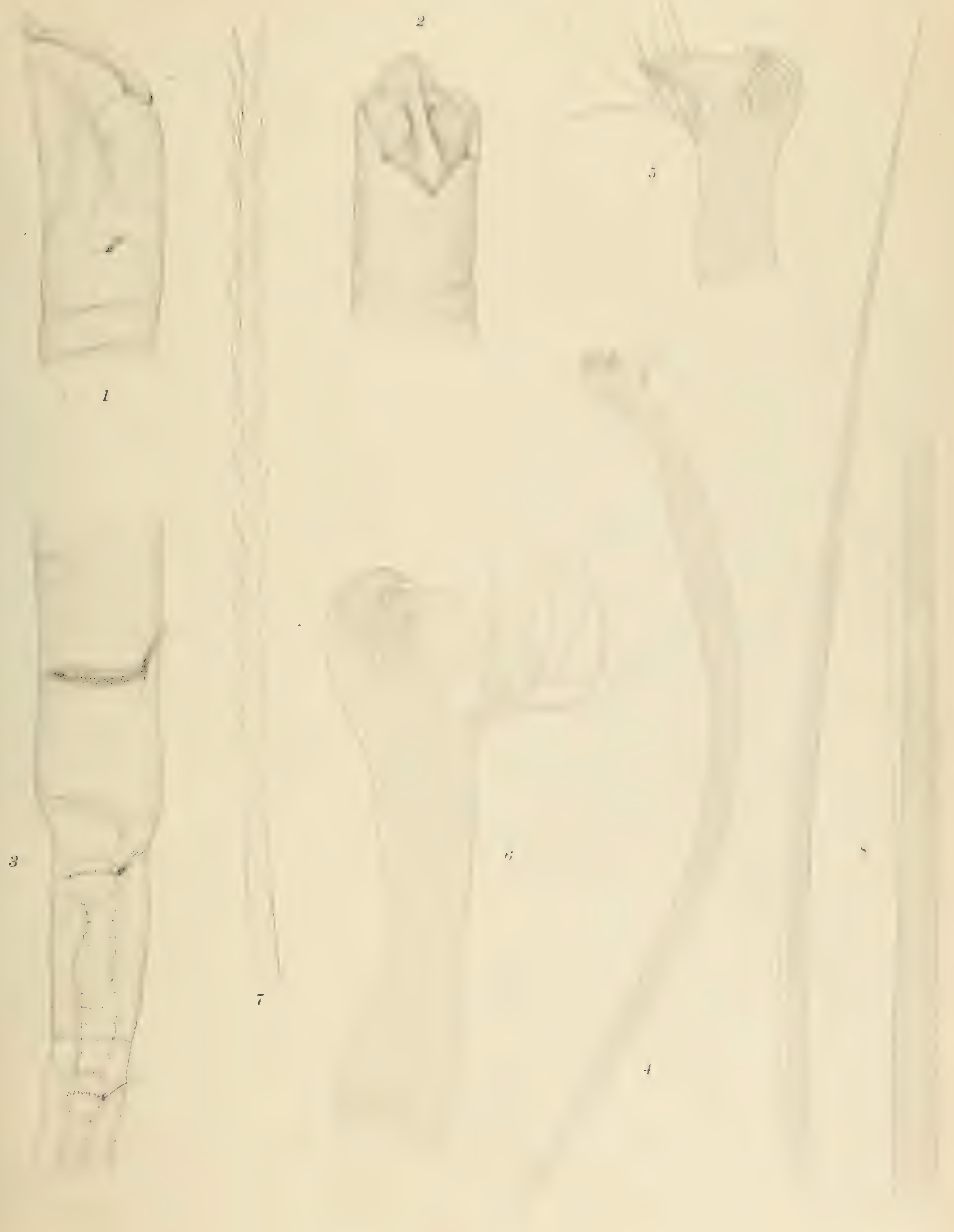


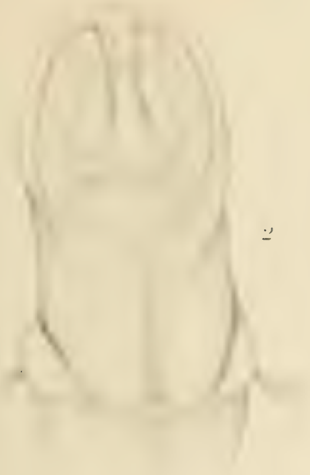
PLATE 72.

PLATE **72**.

Maldanella fibrillata CHAMBERLIN.

Figures 1–6.

1.— Anterior end, lateral view. × cir. 8.5.
2.— Anterior end, subdorsal view. × cir. 8.5.
3.— Caudal end, lateral view. × 8.5.
4.— Uncinus of third setigerous somite. × 337.
5.— Distal end of uncinus of normal form, third setigerous somite. × **cir. 1150.**
6.— Distal end of uncinus of occasional form, third setigerous somite. × **cir. 1150.**



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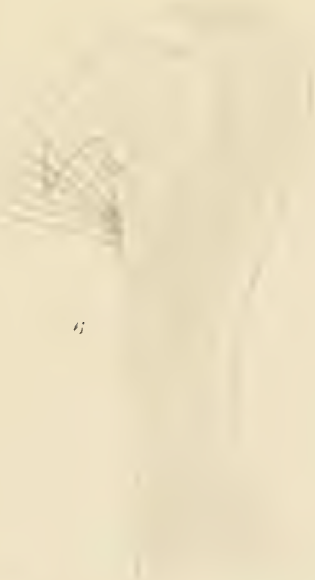

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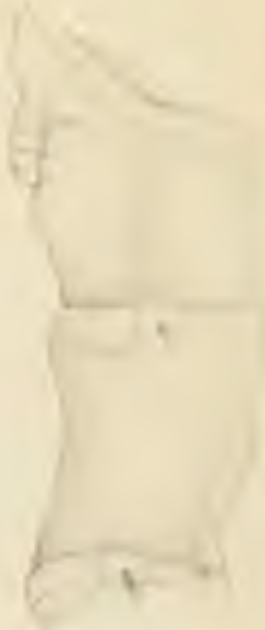

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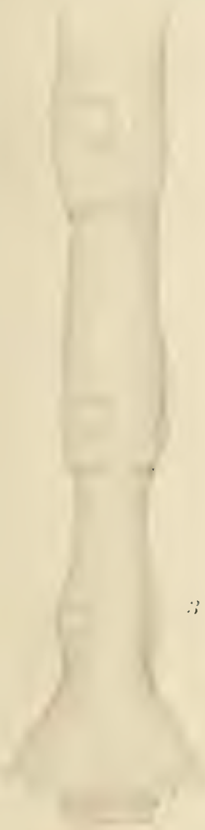

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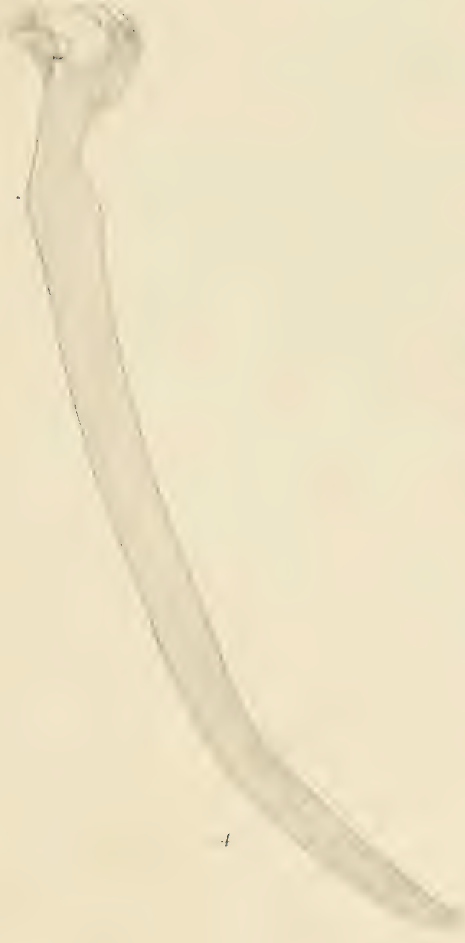

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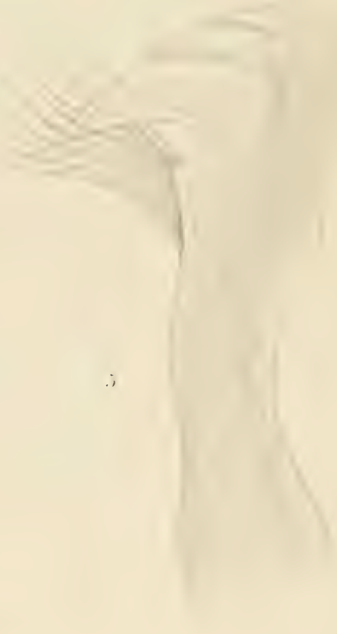

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PLATE 73.

PLATE 73.

Maldanella fibrillata Chamberlin.

Figures 1, 2.

1.— Distal end of capillary seta of third setigerous somite (fibrillae not shown). × 337.
2.— Portion of middle region of same. × 337.

Petaloproctus crenatus Chamberlin.

Figures 3-7.

3.— Caudal end, lateral view. × 337.
4.— The same, dorsal view. × 337.
5.— Distal portion of major capillary seta of eighth somite. × 337.
6.— Uncinus of eighth somite. × 337.
7.— Distal end of same. × cir. 1150.

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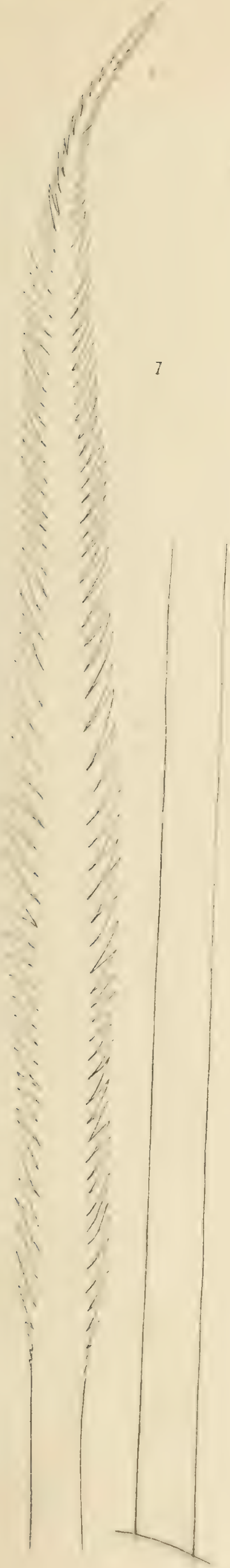
PLATE 74.

PLATE 74.

Idanthyrsus regalis CHAMBERLIN.

Figures 1-8.

1.— Neuropodial seta of second thoracic somite. × 113.
2.— Portion of neuropodial seta toward tip, eighth abdominal somite. × 1305.
3.— Uncinus in profile. × 1305.
4.— Neuropodial paleae, fourth thoracic somite. × 76.
5.— Notopodial paleae of same somite. × 76.
6.— Inner opercular paleae. × 76.
7.— Typical outer paleae. × 76.
8.— Anterior outer paleae. × 76.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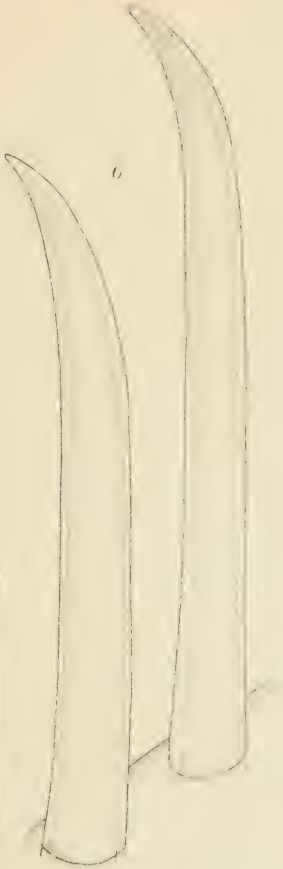
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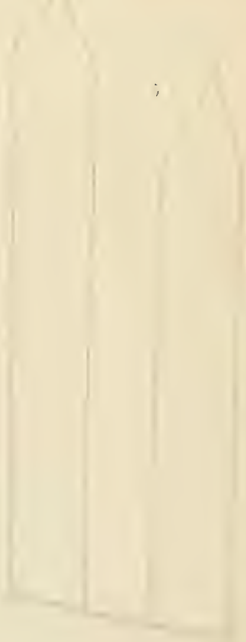
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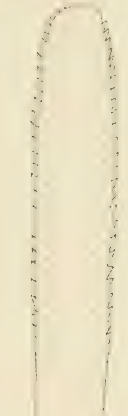
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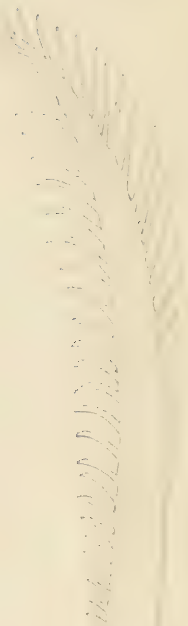
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PLATE 75.

PLATE 75.

Tetreres nesiotes Chamberlin.

Figures 1-7.

1.— Uncinus. × 870.
2.— Seta from thirty fifth abdominal somite, with portion more highly enlarged.
3.— Inner opercular paleae from near anterior end of series. × 51.
4.— Three outer paleae from near caudal end of series. × 51.
5.— Notopodial paleae from last thoracic somite. × 75.
6.— Neuropodial paleae from second thoracic somite. × 75.
7.— Nuchal hook, with adjacent papilla, in outline. × 51.

Idanthyrsus cretus Chamberlin.

Figures 8-15.

8.— Notopodial seta, first abdominal somite. × 306.
9.— Simple seta from notopodium of second pale-bearing somite. × 78.
10.— Uncinus from middle region of body. × 870.
11.— Five of the inner opercular paleae. × 78.
12.— One of the shorter outer paleae. × 78.
13.— Three dorsal thoracic paleae in different aspects from the second pale-bearing somite. × 78.
14.— Dorsal thoracic palea from second pale-bearing somite, surface view. × 78.
15.— Ventral thoracic palea, first pale-bearing somite. × 78.

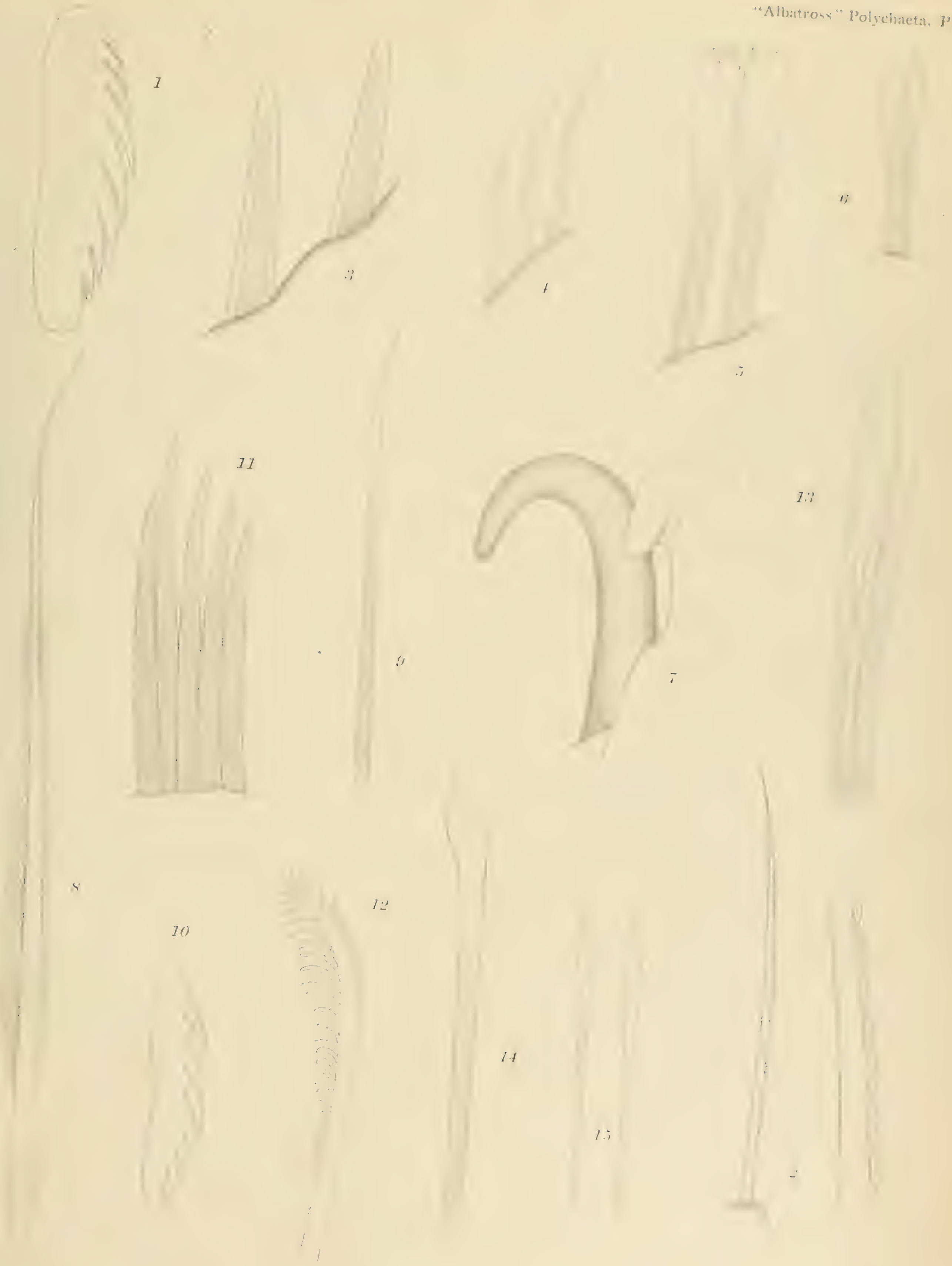


PLATE 76.

PLATE 76.

Amphicteis obscurior Chamberlin.

Figures 1, 2.

1.— Anterior region, dorsal view.
2.— Same, ventral view.

Amphicteis orphnius Chamberlin.

Figures 3, 4.

3.— Anterior region, dorsal view.
4.— The same, ventral view.

Amphicteis uncopalea Chamberlin.

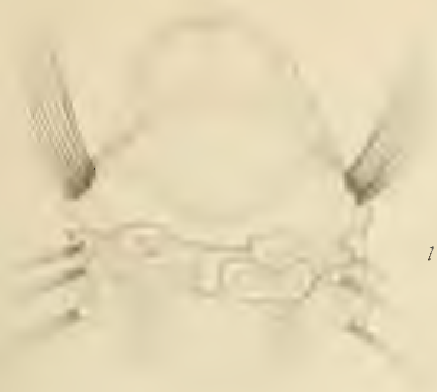
Figures 5, 6.

5.— Anterior region, dorsal view.
6.— Same, ventral view.

Paiwa abyssi Chamberlin.

Figures 7–9.

7.— Anterior region, ventral view.
8.— Branchia. × 11.
9.— Parapodium from median region of abdomen. × 34.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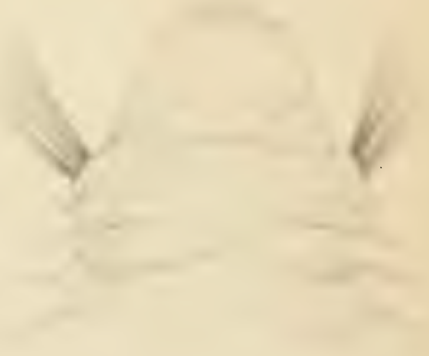
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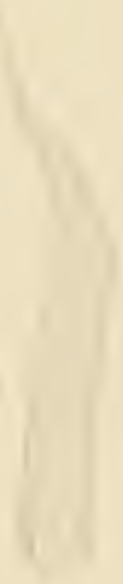
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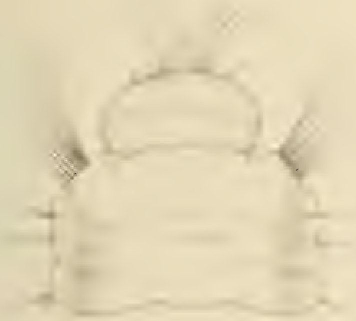
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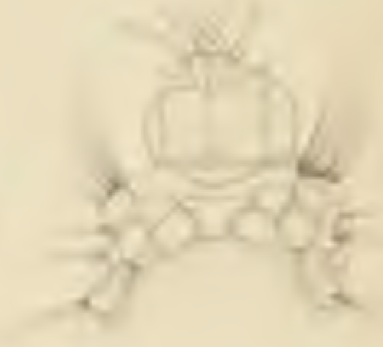
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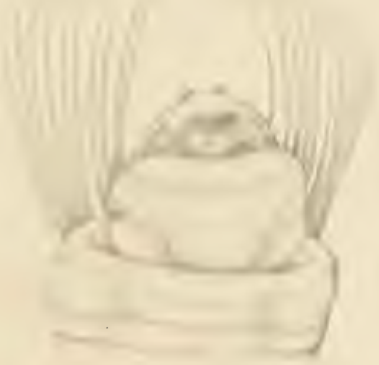
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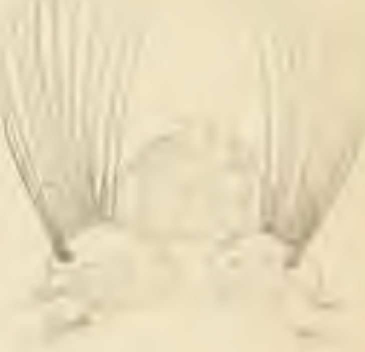
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PLATE 77.

PLATE 77.

Amphicteis orphnius CHAMBERLIN.

Figures 1, 2.

1.— Two of the shorter paleae from above. × 67.
2.— Uncinus, seventeenth setigerous somite. × 930.

Amphicteis obscurior CHAMBERLIN.

Figure 3.

3.— Uncinus. × 930.

Amphicteis uncopalea CHAMBEELIN.

Figure 4.

4.— Uncinus from twelfth somite. × 930.

Pabits deroderus CHAMBERLIN.

Figures 5, 6.

5.— Abdominal uncinus, profile view. × 1075.
6.— Distal end of thoracic seta. × 278.

Ampharete homa CHAMBERLIN.

Figures 7, 8.

7.— Abdominal uncinus. × 1075.
8.— Distal end of notopodial thoracic seta. × 278.

Paiwa abyssi CHAMBERLIN.

Figures 9, 10.

9.— Ninth parapodium, ventrolateral view. × 25.
10.— Uncinus, profile view. × 1075.

Moyanus explorans CHAMBERLIN.

Figures 11, 12.

11.— Thoracic uncinus, profile view. × 1075.
12.— Distal portion of thoracic seta. × 278.

Sabellides delus CHAMBERLIN.

Figure 13.

13.— Uncinus from eleventh setigerous somite. × 1075.

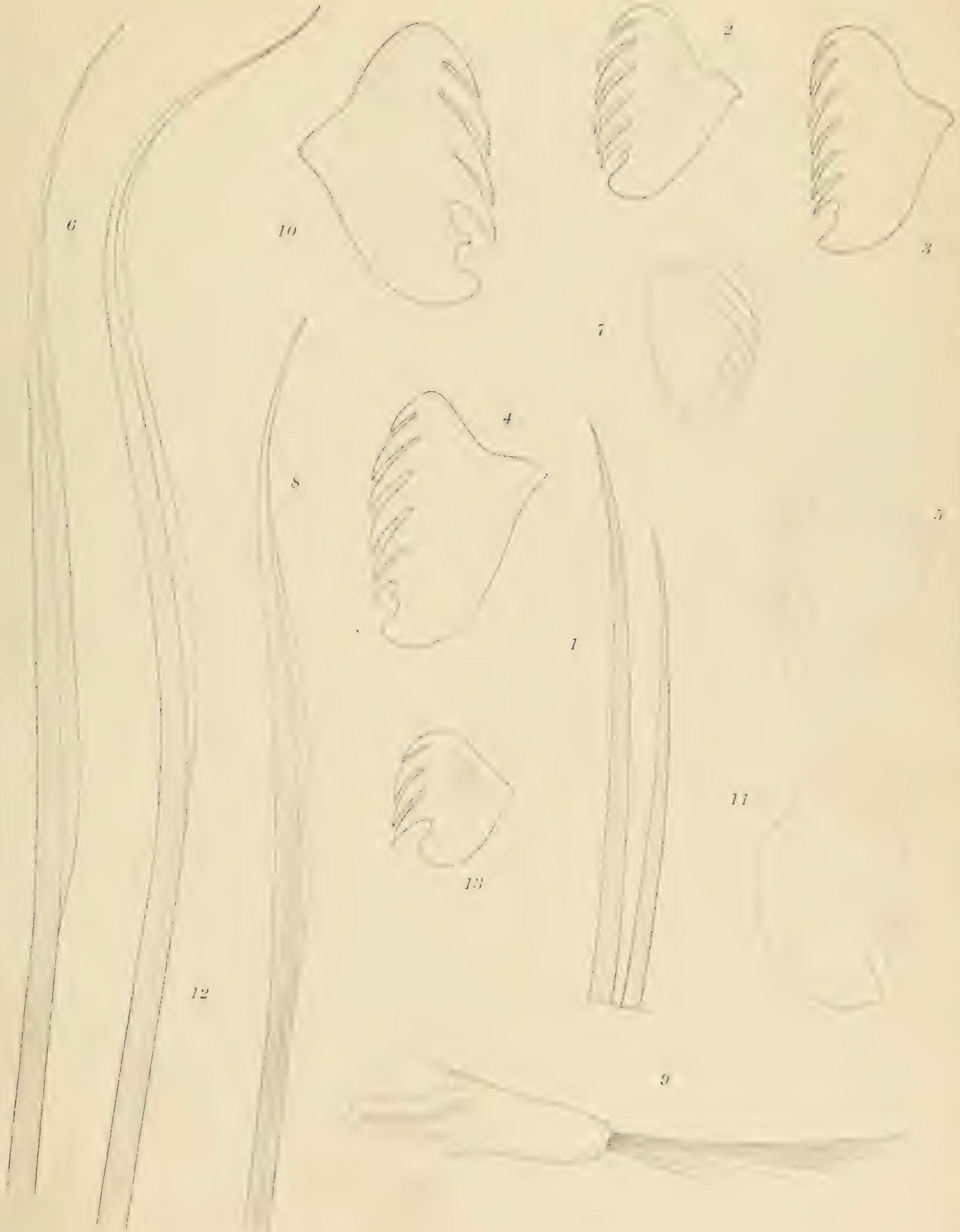


PLATE 78.

PLATE 78.

Paumotella takemoana Chamberlin.

Figures 1-5.

1.— Dorsal abdominal seta from caudal region. × 260.
2.— Setae of sixth thoracic somite, distal ends. × 278.
3.— Abdominal uncinus. × 1036.
4.— Dorsal abdominal seta, median region of abdomen. × 260.
5.— Portion of branchia in optical section. × 58.

Pomatoceros paumotanus Chamberlin.

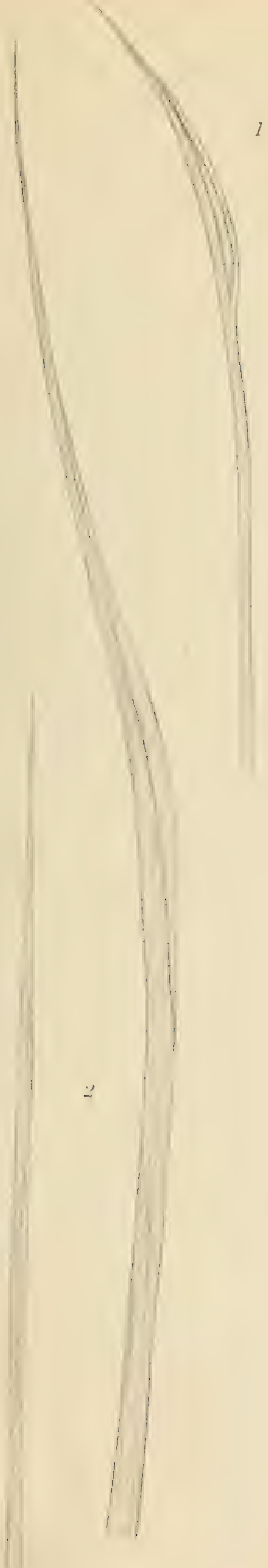
Figures 6-9.

6.— Portion of thoracic seta, tip broken off. × 278.
7.— Thoracic uncinus. × 1036.
8.— Lateral view of operculum. × 15.
9.— Tip of a branchia. × 63.

Sternaspis maior Chamberlin.

Figure 10.

10.— Ventral shield. × 3.75.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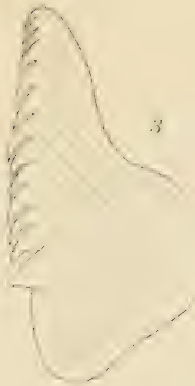
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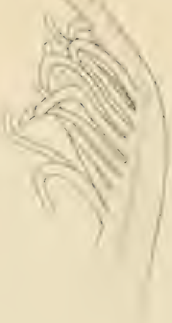
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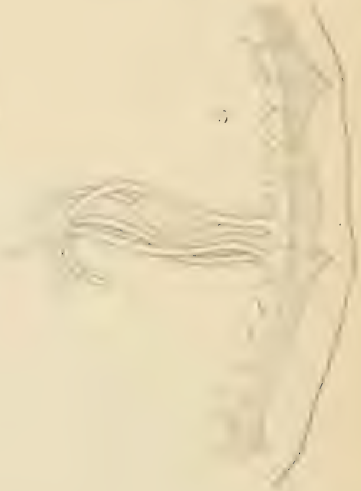
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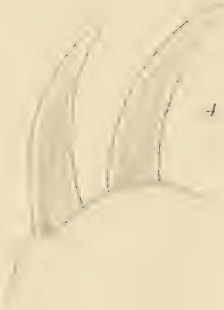
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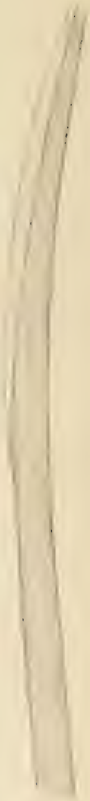
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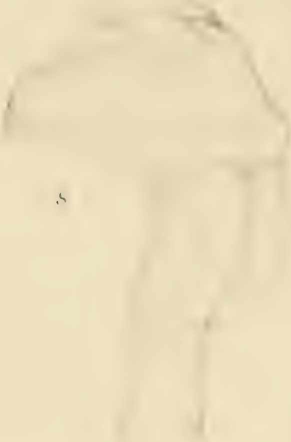
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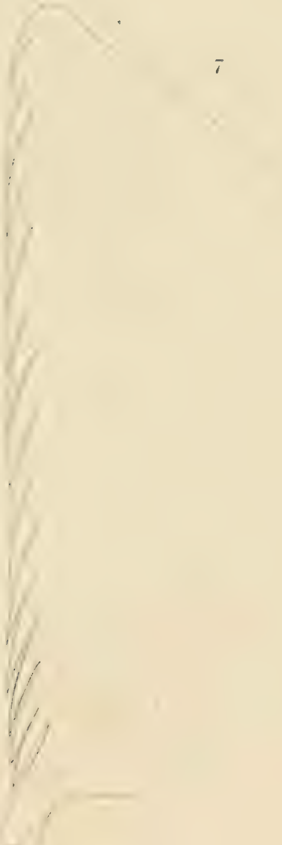
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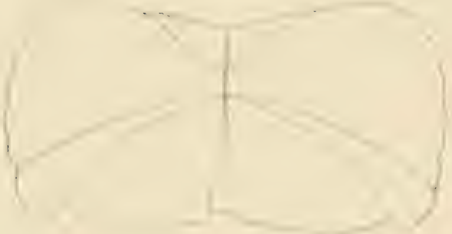
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PLATE 79.

PLATE 79.

Eupolymnia regnans Chamberlin.

Figures 1–3.

1.— Thoracic seta. × 225.
2.— Thoracic uncinus. × 830.
3.— Abdominal uncinus. × 830.

Eupolymnia insulana Chamberlin.

Figures 4–6.

4.— Thoracic seta. × 225.
5.— Thoracic uncinus. × 860.
6.— Abdominal uncinus. × 860.

Terebella panamena Chamberlin.

Figures 7, 8.

7.— Distal portion of thoracic seta. × 830.
8.— Thoracic uncinus. × 830.

Nicolea profundi Chamberlin.

Figure 9.

9.— Thoracic uncinus. × 830.

Nicolea latens Chamberlin.

Figures 10, 11.

10.— Notopodial seta, distal portion. × 225.
11.— Abdominal uncinus. × 860.

Nicolea taboguillae Chamberlin.

Figures 12, 13.

12.— Outline of right lateral flap of third somite. × 20.
13.— Thoracic uncinus, profile view. × 830.

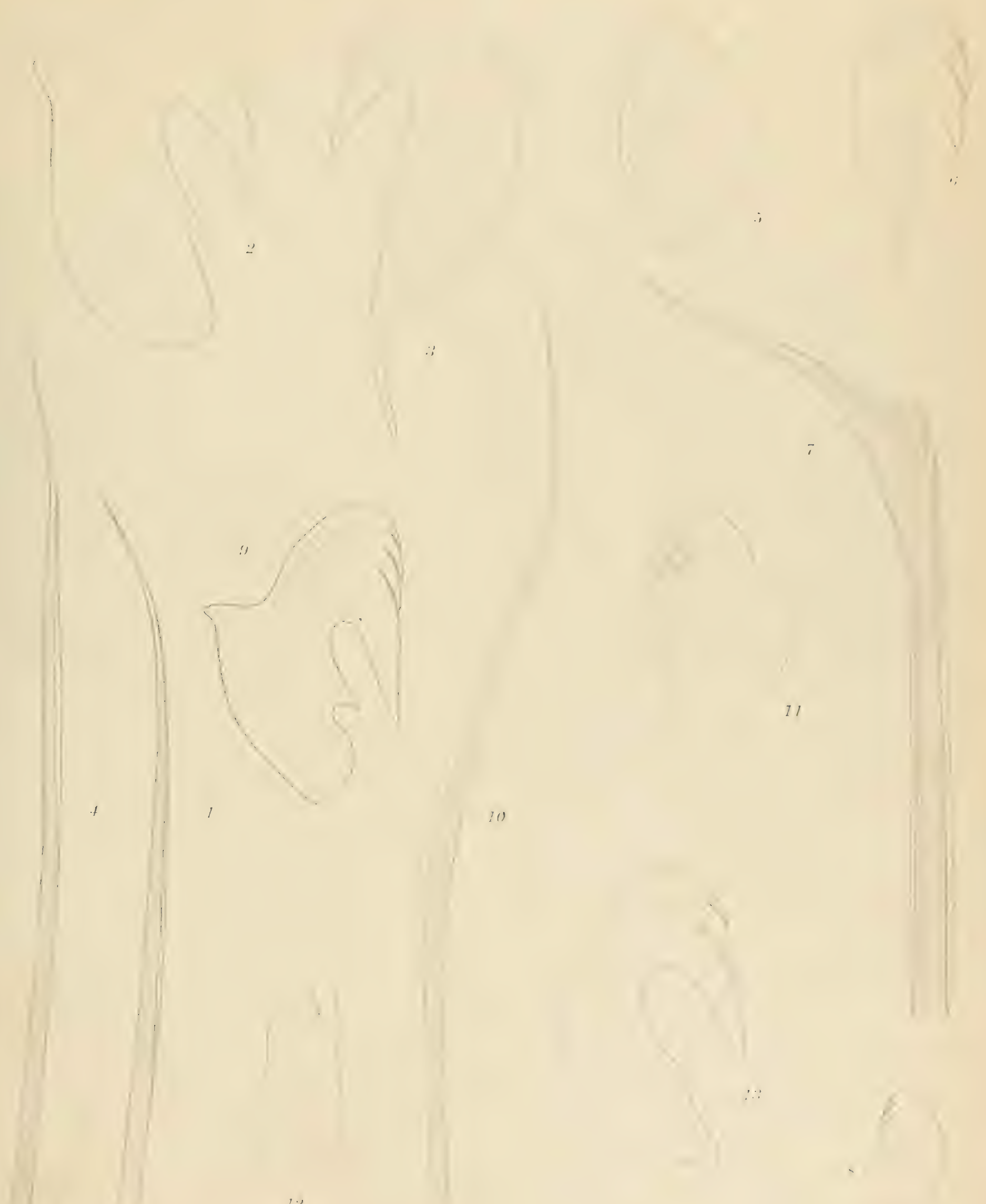


PLATE 80.

PLATE 80.

Nicolea galapagensis Chamberlin.

Figures 1-3.

1.— Caudal end, dorsal view. × 20.
2.— Outline of right lateral flap of third somite. × 20.
3.— Thoracic uncinus. × 860.

Thelepus pericensis Chamberlin.

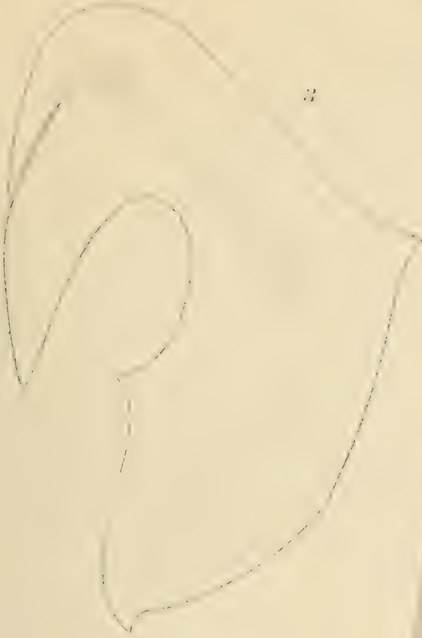
Figures 4–6.

4.— Anterior seta, distal portion. × 225.
5.— Anterior uncinus, frontal view. × 860.
6.— The same, profile. × 860.

Terebellides eurystethus Chamberlin.

Figures 7-15.

7.— Pinnula of anterior abdominal region. × 51.
8.— Pinnula of posterior abdominal region. × 51.
9.— Fourteenth left notopodium, anterior view. × 22.
10.— Seta of tenth thoracic somite, extreme tip missing. × 225.
11.— Thoracic uncinus. × 860.
12.— Abdominal uncinus, profile view. × 860.
13.— Abdominal uncinus, frontal view. × 860.
14.— Another abdominal uncinus. × 860.
15.— Crown of teeth of uncinus viewed nearly from direction of points of teeth. × 860.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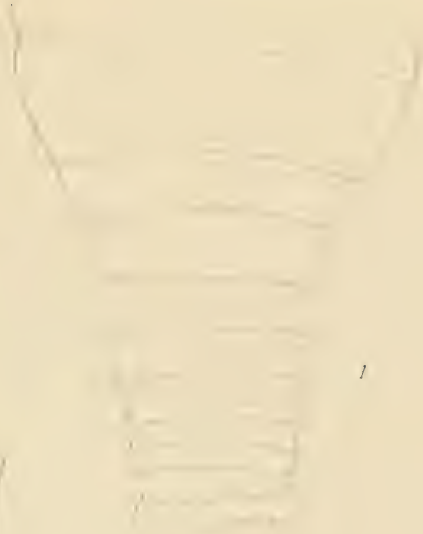
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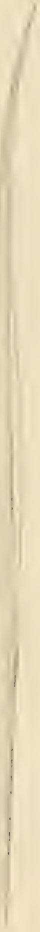
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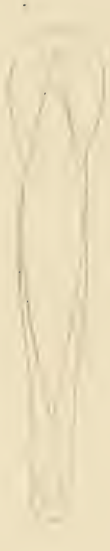
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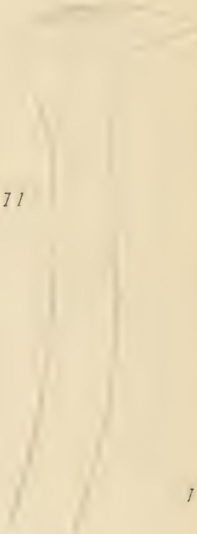
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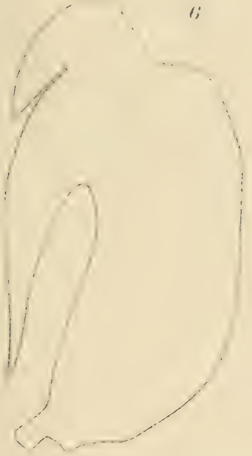
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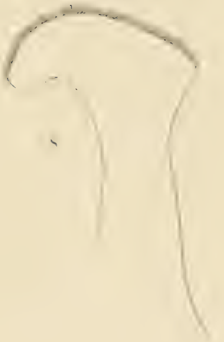

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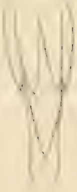
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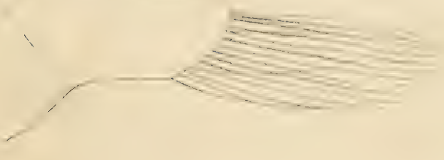
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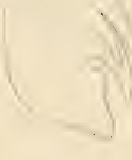
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